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RECENT PROGRESS IN AGRICULTURAL EDUCATION.

BY THE EDITOR.

SOME lines of progress in Agricultural Education are indicated in the laws and decrees issued in certain foreign countries. The full texts of these decrees and laws will be found by the interested reader in the *Annuaire International de Legislation Agricole* for 1917, copies of which have reached this country only recently. As these texts are in the French language and so not available to the general reader, it is proposed to give here a brief outline of the same indicating the nature of each decree or law in question with such other particulars as may be necessary to convey a correct idea of its exact scope.

To begin with, it may be stated that the laws relate to 1917, and relate primarily two European and two American States. The European States are Italy and Portugal and the American States are the United States and Uruguay.

To take the latter two first. A law of the United States of 23rd February 1917, as to technical Agricultural Education allots subsidies to the various States of the Federation, and in this way the Federation contributes to the cost of this type of Education. The separate States, however, should, in order to participate in these subsidies, constitute a Committee of three members which will be charged to co-operate with the Federal Committee of Technical Education instituted by this law. This Federal Committee is to comprise of the Secretaries for Agriculture, Trade and Labour, the Federal Commissioner of Public Education, and three American Citizens nominated by the President, of whom one shall represent industrial and commercial interests, the second agricultural interests and the third the interests of labour. The Federal Committee with the Committees of the individual States must make special studies of agriculture, methods of cultivation, trade, etc., and thus enable these States to set up schools capable of giving really effective and practical technical instruction.

The other European State, Portugal, issued a decree on 6th November 1917, constituting a women's agricultural colony in the town of Alcobaca. Its object is to teach the pupils modern methods of agriculture and agricultural crafts, and to disseminate a suitable knowledge of agriculture in rural circles by means of lectures and practical training. Among the proposed Sections for study and training are the following :—

(1) Fruit Culture.
(2) Horticulture.
(3) Gardening.
(4) Agriculture.
(5) Cattle Breeding.
(6) Technology.

A personnel approximate to the above objects and aims is also sanctioned.

An analogous Italian law has reference to male adults. A decree dated 9th September 1917 (No. 1595) directs that the Provincial Agricultural Commission in every province must organize the technical instruction of the adult peasants by means of short practical courses bearing on crops grown locally, agricultural machinery, agricultural industries, courses of practising lessons in small forest and rural industries, courses of domestic economy, and practical courses in the improving of and settling on plantations. In order to ensure this instruction, the decree places the necessary funds at the disposal of the Ministry of Agriculture. The amount sanctioned may, in passing, be noted. For 1917-18, it was 300,000 lires, and for 1918-19, it was increased to 700,000 lires, which, if necessary, was to be extended for other necessary connected work to 1,000,000 lires. The annual programme of work is to be submitted to the Minister of Agriculture and should have his approbation. Another Italian decree (No. 1947) of 11th October 1917, regulates the granting of the title of *privat docent* in the higher schools of agriculture, and authorizes the official professors of these schools to hold private courses in all subjects which are taught in them and analogous subjects. This decree is an interesting one inasmuch as it sets out fully the conditions on which the degree of *private docent* can be granted. *En passant* it may be remarked that it may prove of value to those interested in the granting of agricultural degrees generally.

A short decree of Uruguay dated the 23rd October 1917, establishes a programme for the agricultural stations for the study of agricultural science. Another decree of the same State and of the same date provides for the reorganization of the work connected with the inspection of agricultural education, determining the qualifications of Inspectors.

Comment on the above laws and decrees is hardly needed. One or two points may, however, be noted. The provision for adult—male and female—training is worthy of remark. It shows the importance attached to the matter of training adults, *i.e.*, the *present* generation, not merely depending on the *future*. A second point is the close attention paid in foreign countries to the study and improvement of *local* crops, and the devoting of increased expert knowledge to them. The United States law is particularly interesting from this point of view. So also is the first Italian decree mentioned above. A still another point is the association of Committees, consisting of experts and ordinary citizens, with Government Committee brought into existence, in the same American Statute. The provision in the courses of study prescribed in the Italian decree for practical courses in small forest and rural industries, is also worthy of note. The great stress laid on *practical* courses, *practical* lectures, and *practical* instruction ought not, again, to be missed by the thoughtful reader. If Agricultural Education is to bear fruit, too much emphasis cannot be laid on the great need there is for its being made thoroughly *practical* in character.

At its fifth meeting held on 15th March the Industries Branch of the U. P. Board of Industries disposed of a reference from Government regarding the draft rules framed under section 11 of the Indian non-ferrous Metal Industry Act 1918. An opinion on the recommendations of the Indian Industrial Commission was also submitted to Government. Rules in connection with the grant of scholarships for training in oil mills in India, were also drafted, for submission to, and approval, by Government.

SUGAR PRODUCTION IN INDIA.

By H. Hamel Smith,

Editor of "Tropical Life," London.

HARPING back to my previous article (published in your issue of January, 1918) urging India to try and make a special effort, with the favourable prospects immediately ahead of us, to make herself self-supporting as regards her requirements of sugar, (and even to produce enough to enable her to export a substantial quantity as well), those who wish to see the industry expand would do well to watch Germany and her labour upheavals.

The International Confectioner of New York, included an article in their January number, contributed by their London correspondent which is worthy of note if only because the writer called attention to the output of sugar in India and elsewhere in the British Empire, as follows:—

"So far as my own buying is concerned," a big London confectionery manufacturer told the correspondent of the "I.C.," "I believe that it will be possible to do without German sugar and whatever the price may be at which they offer it to us, I, at least mean to do without it. Under proper cultivation in suitable centres cane sugar could be produced more cheaply than beet and delivered, in spite of the heavier cost of freight, even when compared with what the trans-continental railway charges on beet-sugar from Germany and Austria now that the war is over."

Later on we are told that, "of course costs at all centres will be higher but the ratio of increase is certain to be greater throughout Germany and Austria than will be the case throughout the tropics," and then against this, are reminded that, "India* if properly equipped, could be made to produce on its present acreage, a surplus of sugar, more than enough, that is, to satisfy its present deficit of 800,000 tons and sufficient even to satisfy the needs of Great Britain. This could be done, were the brains and ability present (among the cultivators) in India that are to be found in Cuba and Java."

The last paragraph but one in this article is by no means the least important for it runs thus:—

"The whole question, as it stands to-day reminds one of the child's query—"Which came into the world first, a hen to lay an egg or the egg out of which the first hen was hatched?"—So I would ask, who must be the first to start, the planter to deserve a preferential tariff, or the public to offer one in the hopes that by so doing, they will induce planters to extend their areas and also to increase their yields by adopting more up-to-date methods out in the fields? The only answer I can suggest at the moment is that the British Government, and that means the British public, are more likely and will be more ready, to offer a preference to British Colonial grown sugar in the hopes of making the Empire independent of outside centres for its sugar supplies, than the producing centres throughout the Empire show signs of being able to earn it on such terms. Many centres are willing to do their best but without the help of India, the best that the rest of the Empire can do, will not render us independent of outside supplies for many generations to come—if ever."

I did not mean to quote quite so fully from the American paper, but there is much more that I should like to reproduce as well, to hope that the paper or the article may yet be read and circulated among sugar men in India. I wanted, however, to bring the foregoing before the attention of your readers, especially the question of increased costs in Germany and Austria, because of what I am now about to say. A table published

**The High Price of Sugar.*, Bales Ltd., London. 1s. 3d. post free.

in the issue of Messrs. Willett & Gray's (of New York) sugar circular of February 27th, points out that the increased costs in Germany last year (1918) already showed an increase of 350 per cent over the figures of 1914, and that this year's, 1919, will be higher apparently, and over four times the pre-war cost. This is what Messrs. Willett & Gray tell us when speaking of the sugar position in Germany at the end of February:—
"The Association for the Development of sugar consumption has addressed a communication to the Department of the Interior, in which is pointed out the extreme necessity of immediately increasing the price of beet roots, as otherwise the industry will be exterminated. The communication has been approved by the German Sugar Association. The following are the important clauses contained in the letter:—

1. If it is not possible to put into the fields, in the spring of 1919, women labourers in quantity, the cultivation of beets for sugar-making, will show a heavy decrease.

2. If sufficient sugar is to be produced, it is necessary that the price of the beets be increased to Mks. 5 per centuer (Fcs. 125 per ton) in 1919, and that the price be published at once.

The following table shows the increase in the cost of production between the year 1914, and last year, calculated in francs per hectare:—

	1918	1914
Salaries	345	105
Labour and transport (of beets)	1,015	260
Coal, freight, &c. ...	985	285
Chemical tests, &c. ...	360	140
Taxes, rent, &c. ...	115	35
Per Hectare Fcs.	2,820	825

This is what last year's crop cost, when the military cheque still had Germany in its grip and when everyone had to do what as he or she was told to help to win the war for Germany and so try to save the skins of the Kaiser and the Crown Prince, no matter how much everyone else suffered. Then again, as we are reminded, this year's crop again depends on whether there will be adequate supplies of women willing to work in the beet fields; from all one hears, those anticipating such a labour supply may not receive all they hoped for and thus costs would again go higher whilst transport costs on all sides during 1919, are likely to be far ahead of 1918, when the military had control and had all the rolling-stock, engines etc., that they had stolen from France, and elsewhere and the facilities and ability to move goods far less.

Even were 1919 to show no higher costs than 1918 as regards the German output of sugar, it will still be nearly 350 per cent more per hectare than in 1914, whilst the yield per hectare is much less, (20.024 kilos as compared with 34.036 kilos in 1914). Before the war also a ton of beets was worth Fcs. *30* a ton only, now we are told, at least Fcs. 123 tons must be paid, or over 400 per cent rise. "Some rise" as the Americans would say. All this bears out what the writer claimed in *The International Confectioner* and should be good news for India and all centres striving to turn out British canesugar at a price to compete with German beet. With a rise like this in Germany, although our costs have also risen, we ought to be able to turn out cane sugar and even deliver it to the factories in the U. K. at prices considerably below Germany or elsewhere on the Continent. There is no doubt that we could, and since this is so, if we do not start right now to produce that sugar with all these points in our favour, we never shall.

To give some idea of what large increased amounts will have to be paid out in Europe if the beets are to be grown for supplying the sugar factories not only in Germany and Austria, but also in Russia and elsewhere—for all countries will have to pay much higher rates—I will include the following

table contributed by Dr. Pruisen Geerligs to *The Louisiana Planter*:—

Production of beet sugar in Europe.

Tons of 1,000 kos.	1913—14	1914—15	1918—19 Crop.
Germany ...	2,718,000	2,564,000	1,400,000
Austria-Hungary.	1,688,300	1,619,000	900,000
France ...	781,000	295,000	100,000
Russia ...	1,688,000	1,939,000	700,000
Elsewhere ...	1,286,100	1,259,000	705,000
Totals ...	7,161,400	7,676,000	3,805,000

Messrs. Willett & Gray, gave the World's crops of sugar cane and beet, as follows in their issue of February 27. This includes British India at 2,950,000 tons for 1918-19 3,229,000 in 1917-18 and 2,728,000 tons in 1916-17.

Sugar Crops of the World.

	1918-19	1917-18	1916-17
Cane.	Tons	Tons	Tons
America N & S.	6,293,660	5,717,012	5,460,997
Asia ...	5,180,000	5,633,942	4,962,855
Australia and Polynesia ...	306,000	425,900	292,831
Africa ...	564,000	544,916	522,513
Europe—Spain...	6,000	6,000	4,584
Total of cane ...	12,349,660	12,327,770	11,243,780
Beet.			
Europe ...	3,692,900	4,172,672	4,856,337
U. S. A. ...	665,000	682,867	734,577
Canada ...	22,300	11,250	12,500
Grand Totals...	16,729,860	17,194,559	16,847,194

With regards to cost of canesugar manufacture on the estates, I see by the fourteenth annual report of the Directors of the Antigua Sugar Factory Ltd., of the West Indies, the total tonnage handled was 64,282 against 102,601 tons during the previous season. No wonder, therefore, that the directors complained that in spite of their appeals for larger and more regular supplies even during the 102,600 ton season, that their last crop left them with 627 hours idle for want of cane. Such a spell is bound to affect costs. As things were, the original contractors who sent in 16,267 tons of cane are down as having received 1-19-0¾d. per ton of their cane, whilst new contractors, who sent in 46,116 tons, received £1-9-4 per ton including the bonus. A further 1,897 tons supplied by peasant proprietors was paid for at the rate of 0-18-10¾ per ton.

Now coming to the factory charges for making up this raw material, *i.e.*, the cane into sugar, these are returned as having been £5-11-1½d. per ton of sugar made, including salaries, wages, repairs, duties, and local taxes. This shows a large increase on the charges for the previous crop although railway transport was less by 4s. 3½d. per ton. Altogether the increased cost seems to have worked out at 15s. 2¼d. per ton (see *Agricultural News* of Barbados for February 8 and 36.)

Other particulars given show that 7,316 tons of sugar were made (out of 64,282 tons cane) as compared with 11,705 tons of sugar, ex 102,601 tons of canes in 1917 and the total proceeds from the sale of the sugar and molasses came to £176,835, as compared with £252,617 in 1917. As the expenditure amounted to £124,338, a balance of £51,297 was left for dividing, and of this sum, £19,219 went as bonuses to the new contractors, whilst of the remaining £327,78, half was paid out as bonuses to the original contractors (hence the higher remuneration for their canes) and

half placed to the credit of the shareholders, and as liable to Excess Profits Duty. Under the latter heading £16,578 went into the coffers of the Imperial Exchequer in 1917, whilst £3,060 was paid locally for export duties.

Taking another central factory, that at St. Kitts (or St. Christopher to give its full name). Here the crop was also small, 40 to 50 per cent below the figures for 1917, and with the cane gathered the dry weather increased the fibre content from 14·15 per cent in 1917, to 16·02 per cent last year. Here again small supplies sent up costs; on the other hand, the sugar last year seems to have realised higher rates than in 1917.

The total amount of cane dealt with in this factory (in St. Kitts) was 62,354 tons during last year. Of this quantity, 55,820 tons were supplied by the original contractors who received, including bonuses, £1-5-10½ per ton whilst outside suppliers sent in 6,533 tons, and obtained £1-5-6 per ton. The factory charges were £4-19-2¾ per ton of sugar made; the railway transport £1-12-7¾ per ton, and the administrative charges of the London office 3s. 8½d. per ton. There were 7,314 tons of sugar produced, and the net proceeds from the sale of sugar and molasses amounted to £171,616, which, after deducting the expenditure, left £32,752 for division between the cane suppliers and the shareholders. The latter's share again being subject to excess profit duty which in 1917 (not last year) amounted to £24,554 whilst the export taxes came to £4,085.

The St. Kitts analyses showed a sucrose content in the cane of 13·02 per cent, sucrose left in megass 2·55 per cent, recovery of sucrose in the cane 86·55 per cent.

WANTED—A NEW OPENING FOR AGRICULTURAL GRADUATES.

By K. Kunhikannan, M.A.

It would not be an exaggeration to say that the Agricultural Colleges in India are yet far from justifying the primary object of their existence. In so far as they have trained men for service in the Departments they have served a useful purpose. But the main hope of the pioneers of Agricultural Education that a band of trained men would go back to land to settle amidst the rural population and help in the diffusion of scientific methods, is yet very far from realisation. The bulk of Agricultural graduates seek for appointments before the ink on their certificates is dry and the increasing requirements of a rapidly developing department are such that a fair number are annually absorbed. For those who do not gain admission a generous government have declared that for purposes of entry into other branches of Government service a course in agriculture is as good as any other course.

With these facilities and concessions the Agricultural college has simply become another avenue for government employment. The applicants for admission are mostly students who, having proved unequal to the strains of literary education, try to make up for lost time by entering the one College which gives them the last chance of obtaining government employment. The attraction has, therefore, been not to quite the right sort of men. As soon as the course is over they seek the most varied employments, and among them may be counted clerks, accountants, Plague Inspectors, Revenue Inspectors and Surveyors.

The result might have been foreseen. The colleges were instituted at a time when both success at the examinations and admissions into Government service had become

extremely difficult and there were growing a class of half-educated unemployed to whom the new institution came as deliverance; and the concession that the Agricultural graduates could be admitted to other ranks of government service, intended as it was to attract students to the college was extremely ill-judged for it helped to divert even the residue left after meeting the requirements of the Agricultural departments, from returning to the land. In fact, the history of Indian education is being reproduced on a smaller scale in this its latest branch. It was the aim in the early years of British Rule that Indian Education would make for their rapid diffusion of western culture and for the elevation of character, instead of which we had the experience of the system becoming little more than a huge machinery for the manufacture of clerks and minor executive officers of whom large numbers were required year after year. So with Agricultural education. Started with the idea of bringing into existence a class of scientific farmers the agricultural colleges have become instead training grounds for recruits to the Agricultural Department.

That the Colleges ensure a supply of men adequate to the needs of Agricultural Department is certainly a point in their favour. But even this has to be accepted with large reservations. For the standard fixed for admission to the college is not regulated by the requirements of efficiency and intelligence which is necessary in a Government Officer but by the minimum required to make one a scientific farmer is by no means all the equipment required to make one a successful agricultural officer. There can be no doubt so serious an anomaly will make for inefficiency among the Departmental Officers.

These are unpleasant facts which should no longer be suppressed. There is little use in trotting out the commonplace that Indians prefer the security of a government appointment in the freedom of an independent living; nor is it easy to believe that the agricultural graduates have little confidence in the methods in which they have been trained. It would indeed he time for closing up the department if the men trained in the Agricultural College believed that they cannot by adopting the improved methods either on their own lands or on those of others, earn the mere pittance with which they are usually started in the Department.

The results have fallen so far short of expectations because the agricultural graduates find no openings outside the Departments, where they can turn their newly acquired knowledge to good account. Whatever their own ideas their parents or guardians are not advanced sufficiently in scientific methods to believe in scientific farming and they are seldom prepared to hand over to them the management of their lands. The young man has only a share in the family property which will not be made over to him for management and which on partition would leave him too small a fragment for economical working. A third and more serious obstacle is the want of capital. Or again there may be a long lease running which it is not easy to cancel. In the case of a young man who had none of these obstacles but nevertheless entered the Department enquiry elicited the interesting explanation that he could direct scientific farming in his estates by occasional visits and by correspondence and any deficiency in this method was more than made up by the pay he received.

Most of these difficulties arise from the fact that in the peculiar conditions of India there is very little chance of capitalist-farming on any large scale or of its advantages being perceived by the people. The large land-owners are either men who are engaged in non-agricultural pursuits and have neither the inclination nor the leisure to give more scientific direction to the cultivation of their lands or if they belong to the rural classes are precisely at the level of the

ryots in regard to their attitude to scientific agriculture. To the small class whose attitude has been changed for the better by education, the scattered nature of their lands is an insuperable obstacle to the employment of improved methods which are seldom successful unless the property is in one continuous block.

These are some of the difficulties in the way of the agricultural graduates going back to the land and they will long remain as serious obstacles. It is difficult to estimate the loss from absorption into Government service of men who could as scientific farmers have served admirably as an agency for the dissemination of useful knowledge in Agriculture among the rural population and who could from their freedom from official taint command to a greater degree the confidence of the ryot than Government servants can ever hope to produce. If they are attracted back to their calling, the scientific methods which they will adopt will soon spread among the ryots who are always ready to adopt methods practices once their superior merit has been demonstrated. They will help to further test and verify under the varying conditions of their localitis the results which the Department obtains by the experiments usually conducted in one. They will be able to interpret the needs and requirements of the ryot to the Department and the ideals and objects of the Department to the ryot.

These are some of the more important advantages to be derived from attracting trained men to the land which more than justify the exertions of Government in that direction. Indeed the Agricultural College by itself without a scheme for retaining on land the men trained in Agriculture will remain a half measure that will continue, to defeat the very object of its existence as it has done in the past. It seems, therefore, necessary to create a counter attraction to the department by bringing into existence a number of large estates all

offered to Agricultural graduates under more or less the same conditions as are imposed in the hire purchase system. Implements and manures should be given by Government. Periodical advances for wages but including also an allowance for personal expenses of the farmer should also be made. The cost of these with interest at 6 per cent should be recovered in instalments which shall be distributed over a number of years according to the kind of land. Until the money is fully paid back the farm will remain the property of the government. The amount to be paid each year shall be fixed by the government. The lessee shall bind himself to work the estate for at least a period of ten years. Failure to pay the instalment or mismanagement will be followed by forfeiture.

Once the claims of the government have been discharged, the estate should become the property of the farmer. The supervision and control hitherto exercised will be withdrawn. But one restriction will remain for which perhaps special legislation may be necessary. The estate should be exempt from the operation of the ordinary Hindu laws of inheritence. Without this safeguard the property is liable to disintegration in the course of a generation or two and there will result the same fragmentation of land into small attenuated holdings which is one of the chief obstacles to scientific agriculture in India. The property should, therefore, descend by inheritance to only one among several heirs who should be allowed to purchase the rights of others.

The value of the estates so managed and so safeguarded from disintegration can scarcely be exaggerated. They will demonstrate to the large class of absentee landlords the value of scientific direction and control. Scattered over the country they will be the centres from which will spread to the surrounding areas the methods of improved scientific agriculture. To the Agricultural department they will be a valuable auxilliary to the demonstration carried out by its officers and as helping the rapid accumulation of a mass of accurate agricultural data which will minimise the risks that attend what is the occupation of so large a proportion of the Indian population. In the services thus rendered to the Department and to the ryots, the State will more than

CO-OPERATION IN BENGAL, 1917-18.

By "Rusticus."

As time goes on, cracks are beginning to appear here and there in the imposing co-operative edifice which has been built up in India. There is still no doubt about the stability of the building but if the cracks are allowed to go on widening, its safety will be endangered before long. Fortunately, the architects are fully alive to this and the requisite repairs are being undertaken. In the latest Report on the working of Co-operative Societies in Bengal and the review thereon, neither the Registrar nor the Local Government shows any desire to gloss over unpleasant features. Mr. Donovan frankly admits that the fact that overdue loans outstanding with members of Agricultural Societies, which in 1916-17 exceeded 17 lakhs out of a total of 55 lakhs, increased in 1917-18 to 28 lakhs out of a total of 64 lakhs is one the seriousness of which cannot be minimized. He explains it hy the low prices of all agricultural produce, except sugar-cane, which prevailed in Bengal throughout 1917-18. The cultivators had not the money to pay their primary societies and this, in its turn, reduced the resources of the central banks which were not only unable to recover their loans to societies but also to secure fresh deposits, as the prosperity of the class of depositors which favours them is dependent on that of the cultivator. Again, new supervisional unions could not be formed as the societies were under the impression that, by combining into unions, they would undertake additional liabilities at a time when they had difficulties in meeting those actually existing. The outlook this year, owing mainly to the rise in the price of jute, is distinctly brighter and Mr. Donovan reports that collections are progressing most satisfactorily, especially in the jute districts, in some cases being ten times as great as they were on the corresponding date last year. But it is obvious that far too many members of co-operative societies have yet to learn that the true aim of co-operation is the promotion of thrift and not of indebtedness. More propaganda work is essential if this lesson is to be driven home and such work cannot be carried on properly except by an increased staff. An increase in staff is also essential in order to ensure the removal of another ugly feature of the movement in Bengal, the misappropriation of cash balances by secretaries and treasurers and the appropriation of large loans by office-bearers which occur much more frequently than they should. Mr. Donovan has no reason to complain of the way in which he has been treated by the Local Government in the matter of staff. During the year under review, three Deputy Registrars with the powers of a Registrar were appointed, the number of Government Inspectors was increased from 22 to 42 and a Chief Auditor and 14 Auditors were added to the strength of the Department. Half the cost of the Chief Auditor's appointment is borne by Government, the whole cost of the Auditors, whose pay is Rs. 75 a month being met from audit fees levied on societies. The effect of this increase in staff should not be long in making itself felt. It is, however, necessary to utter a word of warning in this connection. We learn that a proposal to allot a sum of Rs. 50,000 to the Co-operative Department for a Joint Registrar and Inspectors for industrial societies was carried by a large majority in the Bengal Legislative Council. The mere formation of societies from above is not sufficient. There must be a spread of the true co-operative spirit. One would have thought that the dangers of forcing the pace too rapidly were already sufficiently apparent both in Bengal and elsewhere.

Judged by figures alone, the progress in Bengal 1917-18 was not unsatisfactory. The number of societies increased from 3,086

to 3,643, the number of members from 1,43,448 to 1,62,986 and the working capital from just over Rs. 1½ crores to very nearly Rs. 2 crores. The Province has at last got a Provincial Bank which commenced operations on April 1st, 1918, and by June 30th had 31 societies as members and a paid up share capital of Rs. 82,625.

We have already commented on the outstanding features of the working of the ordinary societies by which we mean societies for the provision of credit to agriculturists. As for non-agricultural societies, the Bengal Co-operative Department is devoting special attention to Weavers' Societies. A brief description of the organization of these societies may be of interest to co-operators generally for, as Mr. Donovan says, there is a widespread impression that there is a great future for the handloom industry, if it is organized on co-operative lines. The impression has, at present, very little foundation in fact. The list of obstacles given by Mr. Donovan is a very lengthy one. The intrinsic difficulties which have been encountered are the unreliability of the weavers, which makes it impossible to enter into regular contracts with them, their conservative instincts, which make them regard with suspicion any attempt to improve their lot, their credulity, which makes them believe the wildest rumours, and their superstitions, which involve a great waste of their time. The difficulties from outside have been the high and fluctuating price of yarn, the desire of the money lender to exploit his weaver clients to his own advantage at a time of shortage of cloth and the ready sale the weaver has found for his cloth which has often been bought off the loom. The high price of cloth has given the weaver a temporary prosperity which has made him opposed to joining a society which enforces discipline and does not promise immediate profits far beyond what he can get by his own, disorganized methods. societies in Bengal increased in 1917-18 from 34 to 65. The model adopted has been an Irish one, that of the Aran Fishermen's Co-operative Society. Each member is expected to pay eight annas towards shares in the society and to contribute from his earnings one anna in the rupee towards further share capital. A society of twenty weavers would thus begin with Rs. 10 capital and the weavers could earn at least Rs. 20 per month each, which would enable them to contribute Rs. 1-4-0 each or Rs. 25 in all towards capital in one month. After a year, their capital would amount to Rs. 300, which Mr. Donovan considers quite enough to keep them out of the hands of middle-men. Experience of so-called weaving societies at Serampore and Faridpur has compelled the Co-operative Department to decide that no money should be lent to any weavers. Only yarn, other materials and looms are advanced and the materials have to be accounted for in cloth, the loom remaining the property of the society until the weaver has paid for it. As each society cannot arrange to get its yarn wholesale, the societies have been grouped together into a union in which each society purchases shares with its own share capital. The union gets yarn wholesale and arranges to dispose of cloth which its affiliated societies are not able to sell. A passed student of the Serampore Weaving Institute has been placed with each little group of societies to instruct and supervise them.

The scheme is an excellent one but Mr. Donovan emphasizes that nothing yet accomplished can be claimed as a success and that the outlook is very uncertain owing to the characteristics of the weavers and the likelihood of renewed competition from the mills when peace conditions are fully resorted. None the less, the Bengal Co-operative Department is to be congratulated on a bold and interesting experiment.

Another development which deserves

milk societies in Baraset. There are now six of these. They send their milk in locked cans to Calcutta. It is tested before despatch and on arrival and the consumers, therefore, are certain of receiving as it comes from the cow. The great obstacle to progress is the high cost of management which is due to the fact that the societies, though close together, will not combine. Each of them sends a man with its milk to Calcutta so that six men travel daily, where one would be enough. At present, only nine maunds of milk is supplied every day to Calcutta, a mere drop in the ocean of milk required. It is hoped, however, that more societies will be organized and that eventually the milk will be taken to Calcutta by motor. There are great possibilities about this scheme and extensive developments would be very welcome for the supply of pure milk to large cities in India is one of the most important problems which awaits solution by the Agricultural and Co-operative Departments.

We should have been glad to have had more details of the working of the Naogaon Ganja Cultivators' Society which was started in July 1917, in order to eliminate the middleman. The Local Government has granted it a monopoly of trading in ganja and bhang though whether over the whole province or only in its own vicinity is not stated. The monopoly appears a profitable one for the society ended the year with a balance to its credit of over Rs. 5 lakhs, which works out at rather less than Rs. 200 per member. The assistance given by Government prevents the society from being regarded as an object lesson in what can be achieved by co-operative sale of produce. That is a branch of co-operation which is not making any more rapid head-way in Bengal than in other parts of India. 'Co-operation in Agriculture' in Bengal mainly takes the form of distribution of good seed both of ordinary and improved varieties of such crops as rice, and sugar-cane (jute is not mentioned) and the popularization of improved methods of cultivation.

MINOR TANKS IN THE MYSORE STATE AND THEIR BEARING ON THE WATER-SUPPLY.

By E. W. Rutherford,
Oossoor Estate, Hassan.

OWING to the last seasons drought, and the consequent dearth of water, practically the whole of the Minor Tanks both in the Maidan and Malnads have, by the deeping of the outlet, been drained of their last drop of water. Now though everyone with crops, etc., needing water, was energetic enough to deepen the outlet, so as to get the run of the last drop of water from a tank, still it seems to be nobodies job to fill in these drains, even though it means only the replacement of the earth removed, and in the majority of instances would only require an hour's work by one man. With the near approach of the first rains of the season, these outlets, should be prepared against their fall, as these minor tanks are the mainstay of the moisture of the country, and on them depends the springs opening freely. One would like to see an order issued to every Village Official, to the effect, that all outlets should be filled in with first rains. It may seem a small point, but these outlets are the safety-valves of the tanks, and many days water may be easily lost by the apathy of those concerned, and in a year like this, when one does not know what one has got before one in the way of climate, these days of water lost may be a serious affair, and this is really a matter for the people and one that they should not wait for Government to insist on.

It is lamentable how careless the average villager is with his water, till it begins to run short, when he will, when too late try to economize. One often saw even in a year like last, outlets of minor tanks so deepened, that it was only a question of time for the

supply to fail, as once the drain was lowered it never seems to be anyones business to—when crop had received sufficient water—shut off the supply, and not let it run to waste. The majority of the silting up of tanks is due to the above procedure, as the water is quickly drawn off, so is the surrounding soil drawn in.

Government through numerous agencies have been now for years trying to get villagers to take more interest in their water-supply, but though here and there individual tanks may be attended to, the fact that these tanks are interconnected with each other is overlooked. If one examines a series one comes to the conclusion that the first civilized inhabitants, starting from the higher grounds, constructed at every favourable point, embankments in such a manner as to form series or chain of tanks, the outflow from one at a higher level supplying the next lower, and so on all down the course of the stream at a few miles apart. This linking together forming such a continual chain of works that not a single drop of water falling on the catchment is lost in seasons of drought, and but little in ordinary seasons. One hears it said that the water in the rivers is not what it used to be during the hot weather, and some lay the blame to the cutting away of the jungle in the catchment area; but may it not be that the neglect of the principle that each one of these tanks is dependent on another, has led to several of a series being allowed to silt up, with the result that the water of those of the higher level instead of finding a gradual approach to the river, rushes right through, with the consequence that the majority of it is lost, instead of being retained in a gradual flow, which being absorbed in its course, helps to keep the springs always open.

There seems to be some justification for saying that a great increase in the water conserved through the State, might be obtained by the simple means of regarding each tank, from that at the head of a valley right down to that one where outlet is close to the river, as all dependent on one another, and so when any one of a chain is put in order, the one on the higher level, above its inlet, should also be attended to at the same time. It might not be possible all at once to put in order a whole series, but nevertheless means should be taken to embank up the water at all places where tanks existed, even if they are not cleared of their silt, as by this means one will get a gradual flow, and a sub-soil soakage at all times, in the place of a rush of water running to waste. For instance, "A.B.C.D." is a series of tanks. The villagers of "A and D" have their tanks in repair, but B and C are old or neglected tanks. Now if in times of drought, or through apathy, "A" lets out most of its water, this will flow straight to "D" instead of being "held up" at "B and C" with the result that if, "D" also acts as "A" did, the chances are that the whole area of this series will lack water to a much greater extent than would have been the case if "B and C" had acted as stops, and so conduced to a gradual flow of water through the area.

One has almost a complete analogy to this tank system, by comparing it to the old canal system in England, where the water was held up by a series of locks. The traffic on these canals was not able to compete with that of the Railways, or as in some instances the Companies got into the control of the Railways; the result being that the locks were allowed to get out of repair, and thus one has now, nothing but a dry trench, (in which there is some talk of forming roads for fast traffic) in the place of what used to be an even flow of water running through an area of country. If one substitutes the words "Minor Tanks" for "Locks" one has then the whole principle of the influence these tanks have in holding up, and regulating the flow of the water through the Mysore State, and the first cultivators must have realized, from experience, that this was the only way to insure a steady flow of water

always being avaible for their crops. One may take it that they would not have gone to the enormous trouble of forming series of chains of these tanks all through the country, from the head of each valley right down to the rivers, if they had found that one here and there would have answered the same purpose; they must have realized that to be of any real economic use, the flow of water must be made as slow as possible through the area, and that their reservoirs must catch as much water as possible, and each must feed the one below it. One can quite imagine that the first cultivators as a matter of course dealt with the repair and upkeep of their tanks as part of the years cultivation, and not as a lot of the present day ryots are rather given to regard them, *i.e.*, as being something to be avoided if possible.

In conclusion one cannot help adding that when one takes into consideration the heavy rainfall that falls in the different areas of the State it strikes one very forcibly that the whole of this must have been to a great extent held years back when all tanks were in order in the areas in which it fell, by means of these chains of tanks, and from them it was gradually percolated through the country. In fact one has one of the finest irrigation systems in any country, if the principle on which it was founded is always kept in mind, as it is on this that the whole depends, and the breaks as now of several links of the chain weakens the whole if it does not ruin it.

ORGANIZATION OF SERICULTURE IN MYSOE.

BY N. RAMA RAO, B.A. B.L.,
Superintendent of Sericulture, Mysore State.

THE fact that silk has ceased to be solely an article of luxury, and that the world's demand for it is growing much faster than the supply ought to be of special interest to Mysore which is the largest silk producing country in India. It has been repeatedly pointed out that sericulture has an important place in the agricultural economy of the State, furnishing as it does a solution to some of our more urgent problems of rural unemployment, and that its development is no less essential from a humanitarian than an industrial point of view. Before the Mysore silk industry can find in the widening of the world-market scope for strength and growth, it shonld rid its system of deep seated defects, and lift itself out of the narrow groove which holds and confines it. I refer to the defects of organization, which may be classified as internal and external. Under the first class, I would group all defects which directly render production less efficient by raising its cost, or lowering its quality. They affect the work of the grower of mulberry, the rearer of cocoons, the reeler of raw silk. They place obstacles in the way of the best combination of the factors of production, entailing waste on the one hand, and injuring quality on the other. The second class of defects—which I have called external—are defects of trade organization, and weaken our position in regard to the market. They inclnde vicious system of finance, ignorance of markets, and the tendency to cling to traditional methods of business which foster a host of parasitic middlemen who not only sap the life of the industry, but break the wholesome touch

between producer and consumer so essential to the efficiency of the one and the satisfaction of the other. Mysore has every natural advantage for the production of silk, and yet we have secured no new markets, and even in our old ones, we are feeling the pressure of foreign competition. In South India, we barely hold our own, while China and Japan have not only secured a footing but have been steadily gaining ground; in Bombay, large vested interests are against us, and over much of India Mysore silk is a thing unknown. In Europe we have effected no lodgement, though our silk was pronounced as good as the Japanese, when the factories got a chance of comparing the two. This must give us furiously to think.

Mr. E. C. Ansorge * who investigated the nature of the South Indian demand for raw silk in an attempt to discover the cause of the growing popularity of the foreign article, found that Mysore silk still retained its hold on most of the weaving centres, but that it suffered from two grave drawbacks, expensiveness and bad reeling. It might appear paradoxcal—but is nevertheless true—that our silk is expensive, because it is badly reeled.

The cost of the silk to the purchaser does not by any means represent the receipts of the producer. The producer must, of course, be getting enough to make it worth his while to produce at all, but the main part of the profit goes to the middleman. The most obvious way, then, of reducing the cost to the consumer is to cut down the number of men through whose hands the article has to pass before it reaches him. The best trade organization is the simplest and most direct route between producer and consumer, and we shall discuss this point later on. There is still another way of lowering the cost and that is by improving the methods of production so as to turn out at least as good an article at less expense. In this paper I propose to examine the conditions of production to ascertain whether by better organization, Mysore silk could not be produced at lower cost. I hope to be able in a future article to discuss the problems connected with reeling and trade organization.

The first essential of the silk industry is mulberry cultivation. The grower raises the crop either for his own use, or in the expectation of finding a purchaser if sentiment or custom forbids his rearing silk-worms himself. In the latter case, there is an element of risk due to error in forecasting the strength of the demand. The separation of mulberry cultivation from silk-worm rearing makes the former less profitable, and more liable to suffer from the competition of other crops; and this necessarily impedes the expansion of the mulberry areas. Another obstacle to expansion is custom—the sheer weight of what has been done before in a community which views every departure from the well-worn track with mistrust. In the *achkat* of partially silted tanks, and on the margin of irrigation under river channels, there are thousands of acres of land of which the water-supply though normally insufficient for paddy would be ample for mulberry; the holders are content to raise a scanty and uncertain crop of paddy.

The next point which calls for remark is the negligent and slovenly way in which mulberry is cultivated, and the apparent lack of care about the kind of plant put in. In some places—such as parts of Sidlaghatta, Chickaballapur, Closepet and Kankanhalli—the cultivation is good—but this is the exception. The trouble of selecting good cuttings and of careful planting, timely weeding, digging, and pruning, and the cost of an extra dose of manure would pay themselves several times over in increased production.

We come now to silk-worm rearing, which from the number of the persons concerned is undoubtedly the most important part of the industry. When it is stated that roughly speaking each acre out of the 35,000 now under mulberry gives occupation to about four persons, and brings competence and comfort to a household, the magnitude of the

* Report on an Enquiry into the Silk Industry in India by H. Maxwell-Lefroy and E. C. Ansorge; Vol. II. Present Condition of the Silk Trade of India, by E. C. Ansorge, 1916.

human interest is at once obvious. The average rearer utilises the crop of about an acre of land, either raised by himself or purchased, and with the help of the members of his family rears from four to seven broods of silk-worms. If he has his own mulberry garden, he wants money for improving or cultivating it; if not, he wants money for buying leaves; he wants money again for providing himself with seed cocoons; if he has, as too often happens, miscalculated about his supply of leaves, he wants more money for buying a supplemental supply from garden owners, who aware of the urgency of his need, put their prices up in proportion. So money is wanted at every step, and in the absence of an organization for credit, is got anyhow, at any cost. Interest of 200 per cent is not unknown. The most obvious source of credit is the reeling sahukar, who runs a village establishment with a few *charkas*. The rearer gets a loan from him repayable in cocoons at a valuation fixed by the lender, who is usually not averse to making the most of his economic advantage. It sometimes happens—for the use of disease-free eggs is not widespread euough—that the rearing fails through disease, and that the borrower is deprived at one fell stroke of all return for his investment and trouble, and is left without the means of meeting his obligations. This presents an opportunity, seldom missed, of rivetting the fetters. This is a gloomy picture, but by no means overcharged. There are, of course, numerous exceptions due to consistent good luck, or to unusual skill and business capacity, and one likes to think that such exceptions are getting more numerous in recent years; but the majority of our rearers work under the conditions described above, and the fact that the industry lives and thrives in spite of this disastrous mal-organization is eloquent of its vitality and suitableness to its environment.

The most pressing want is an organization for credit; next come organizations for purchase of leaves, seed, and appliances, and for sale of cocoons. Here is an undoubted opening for co-operation. That the ryot finds it worth his while to rear even under the existing conditions proves that the industry is remunerative; that he is able to borrow leaves no doubt of his credit worthiness. An association of rearers with unlimited liability can have no difficulty in getting all the money it wants on reasonable terms. Such an association would be in a position of vantage in buying mulberry and appliances, and in selling cocoons. If some members should have more worms than leaves, there would always be others with more leaves than worms, and an adjustment could easily be effected without waste or inconvenience. The association could lease mulberry enough for its members, and secure them from a sudden rise in the prices of this essential. Should the market be dull, the association could buy cocoons from members at a fair valuation, or accept them in repayment of debts, and get them reeled. It could stock appliances, and keep them for hire or sale.

Perhaps the most important advantage of the association would be its ability to secure a supply of disease-free silk-worm eggs to its members. At present, about two crops out of every five are lost owing to bad seed, and in spite of the best efforts of the Sericultural Department, it will be long before the grainages can fully meet the requirement of the industry. The chief limitations are imposed by want of grainage space, and of staff for such preliminary work as collecting seed cocoons, pairing moths in cellules, etc., which require no specialised skill. A co-operative association could take up these functions, and seek the aid of the Department—which will be willingly rendered—for microscopic selection. This would enable the work of the Department to reach a larger number of people, besides making the association what it should be, a centre of educative and propagandist work. It is needless to dwell on the value to the industry of the interchange of views and experiences of keen rearers drawn together by a common interest.

My suggestions would be incomplete without an emphatic insistence on what I consider to be the most essential step for the improvement of this—as indeed of any other industry. I mean education which fosters a knowledge and love of the calling. The State has been doing all it can to spread primary education, and attempts are being made to give such instruction on agricultural bias in rural parts. I am convinced that it is at least as important to introduce sericulture in elementary schools situated in the silk areas of Mysore.

INDUSTRIAL ENTERPRISE AND CONFIDENCE.

BY M. VARADAIYA, B.A.

IF industries from old established Cotton and Woollen Mills of Bangalore to the great enterprises undertaken to-day, such as the Mysore Wood Distillation and Iron Works, the Factories for the manufacture of Sandal-wood Oil, etc., can be started and, developed in this State, why is it then that in spite of the fact that Mysore possesses many wealthy people the general tendency of the majority of them is still to stand aloof from commercial enterprises? Why is it, again, business confidence has not as yet been established to such an extent as may be desired? The history of the past and the facts of the present as we know them are against finding the sole reason for these in causes such as the climate, the inferior quality of labour or foreign competition. These, of course, all bear their part, but it cannot be denied that there are also other causes which are in part the fault of the majority of the people themselves. Sufficient knowledge, sufficient business experience, sufficient energy has not in all cases been brought to bear in the launching of industrial enterprises, especially the smaller ones. In many cases the vital necessity of sonnd business organization has not been recognised nor the almost equal importance of thorough technical and expert examination of an industrial project before it is decided to be started. It must also be acknowledged that our commercial enterprise has not in several instances shown the energy and the determination to persevere in the face of set-backs which are essential to eventual success. The Goribidnur Sugar Factory and the Marikanave project may perhaps be cited as instances in point. In most cases, our manufacturers want quick

or welcome painstaking and often costly and protracted experiments and as it is with the manufacturer, so it is with the worker. He does not readily take to the unfamiliar; he does not welcome a new machine. The average Mysorean is generally so satisfied with his own methods and achievements that he fails to visualize further progress as possible till some other competitor astonishes him with the unexpected results of his work.

Let us for a moment consider how Japan has come to occupy her present high position in the industrial and commercial world. The promotion of the development of industries in Japan is largely due to the qualities which the people of Japan themselves have shown and the way in which they have imported into their commercial enterprise the same hardihood of body and spirit which have made them conspicuous among the fighting nations of the world. Not only have they displayed great pertinacity and perseverance but they have also proved themselves to possess an unusual genius for combination and co-operation. Their largest industries are organized as guilds and the different branches of trade co-operate closely in the common mission of pushing Japanese things against those of the rest of the world. It is of vital importance that we in Mysore should acquire the same qualities. Some of our leading business men have already exhibited these qualities to a remarkable extent; but the large majority have endeavoured to follow in their footsteps without having appreciated the methods by which success is achieved. Where there is lack of thoroughness, lack of vigour and perseverance, lack of technical or business knowledge and the instinct for combination is absent, there is bound to be a failure which will react on the public and check the flow of capital. It is very necessary, therefore, that confidence should first be established if success is to be attained and this confidence can only

often in Mysore a tendency towards two extremes both equally fatal—one to an excessive timidity and the other to a disastrous recklessness. The one real remedy for both is experience which will convince promoters that success is not to be easily achieved and that only thoroughness in all stages of an enterprise can achieve it and their industrial ventures can be a legitimate and sound outlet for the money invested in them. Success, therefore, rests with the people themselves and there is already evidence in Mysore to show that a keener spirit is being developed during recent years and that the essentials to success are also being slowly but steadily, created.

The Government have also been doing their part of the work. The development of agriculture and industries in the State has been phenomenal. Every effort is being made by Government to make the people reap a rich harvest of the gifts so profoundly bestowed on them by Nature. The Government have been helping the people in providing information as to the sources of raw materials available in the State, the possibilities of their uses for purposes of manufacture, the leading centres of the consumption of the products, raw and manufactured, their market value, etc. They have also by the establishment of the Chamber of Commerce and the Board for Chemical Research and Scientific Advice, set up the necessary machinery for the collection and dissemination of commercial and scientific intelligence which is so essential for the practical work of industrial development, but it is not so easily available to private persons. Assistance is already being given for the promotion of industries by means of technical education. Expert advice is also being given, as far as possible, in regard to commercial enterprise and all available facilities afforded for the investigation of the economic aspects of the schemes proposed to be undertaken. A Central Commercial Museum is in course of formation in Mysore. The most urgent need that is felt at present is the provision of facilities for a thorough technical and scientific examination of new industries which may with advantage be started in the State as well as an extension of laboratories and equipment for conducting the necessary experiments and researches. This need has already been recognised by the Government and the question of supplying it is at present under the consideration of a Special Committee appointed for the purpose.

Notwithstanding the facilities and encouragement that have been, and will be provided for the promotion of industries, the fact cannot be overlooked that whenever a proposition in which any disappointed promoter is interested is not favourably reported upon, his general tendency is to take the view that those entrusted with the investigation of the proposition have assumed a hypercritical attitude in respect of it. But the truth is that everyone who undertakes the investigation of any project is naturally anxious, and will doubtless welcome every opportunity, to report hopefully about any scheme which he is called upon to examine and that it is very much more pleasant to be able to write hopefully than otherwise. There is hardly any one who is unmindful of his duty to the Government and the industrial and commercial interests of the State; but his desire for the expansion of industries ought not to warp his judgment with regard to any proposed project. The general ambition of every right thinking person who undertakes the investigation of a project is to report what is accurate. Whether his report is favourable or not to the investor is not material to him. He is always particularly anxious that it is absolutely correct and conveys an accurate impression of facts as they exist. His sole aim is to guard the public against that form of piracy which leads to general belief in the success of the undertakings put forward for his examination. It is, therefore, only by means

of accurate reports that the confidence of the general public can be won.

At the same time we cannot ignore the fact that the path of the pioneer of any industry in Mysore has generally been a thorny one. There have been many failures before success has been achieved. Any one who cares to read the history of the gradual development, for instance, of the Gold Mining industry on the Kolar Gold Field, will see how true that is. The risk of undue competition in the production of various articles of utility from low priced and abundant raw material is the first drawback which generally threatens the investor in any industry but the stage of equilibrium can be reached and competition need not alarm any producer if he selects his sphere of operations with due regard to the position of the sources of his raw material and of his markets, provided that care is always taken to maintain the standard of the product at an invariably high level. If rival concerns spring up simply because some efficiently conducted business shows signs of prosperity, there is waste of capital and energy which has no public justification and is injurious instead of being beneficial. No new project, large or small, should, therefore, be attempted without satisfactory proofs of its need and utility. It is very important that no waste of money, labour or enterprise should be permitted or condoned, but once an enterprise is decided upon it should be backed and financed for all its worth.

It is very gratifying to note that among the diverse activities now being carried on even the minor industries, especially those which have arisen since the organization of the Mysore Economic Conference, are preparing the minds of the people for larger enterprises. Looming in the distance are industries for (1) the manufacture of Sulphuric acid, (2) Cyanamide, (3) Paper-pulp, (4) Pencils, (5) Preparation of dyes, (6) Cattle and pony breeding, (7) Fruit-canning, etc., and as well as the secondary industries to be derived from these. Whatever care may have been taken in the preparation of a project there may still be unexpected obstacles and it is particularly at this point that Government is looked up to for assistance in what are in fact industrial experiments. This can be rendered in more ways than one. The Government may afford special facilities by providing, or at any rate facilitating the provision of, finance for such trial experiments or by conducting the experiments itself in the way of providing for the producers and manufacturers facilities for economical work and especially cheap transport or by means of suitable agencies for the most favourable marketing and distribution that is possible for their supplies.

There are obvious difficulties which require to be faced. There is the difficulty in all such schemes of how far the Government can spend the ryots' money for such purposes. There is also the difficulty of avoiding any appearance of favouritism in the selection of concerns of industries to be assisted by the provision of funds. Even in the case of the Government itself pioneering the industries, there is the difficulty of avoiding interference with private enterprises. But the end to be achieved is of such great importance to the industrial advancement of the State that it warrants such risks and difficulties. What is now required is the preparation of practical plans of campaign which the people can with confidence put into practice and which are so necessary for strengthening the industry and commerce of the State for the competitive struggles of the future. The most useful thing that could be done at the present moment appears to be to cencentrate attention upon the construction and details of schemes of this kind.

The main items which appear to require immediate consideration are:—

(1) Extension of provision for industrial research;

(2) Devising means for the utilization of the various resources of the State;

(3) Provision of better facilities for investigation; and

(4) Co-ordination of industrial investigation and elimination of overlapping in such work.

Our people should also be taught to co-operate in organizing business so that we can enter the World's markets with a sufficiency of goods of the right kind at the right place. The more efficient an industry becomes in all its branches the greater will be the confidence of every individual engaged in it.

A SCHEME TO PROVIDE HOME GROWN TIMBER.

THE Final Report of the British Forestry Sub-Committee of the Re-construction Committee (Cd 8881) has been issued. It recommends a comprehensive scheme for national afforestation and the Minister of Re-construction is carefully considering how far and in what way effect may be given to the proposals. The Sub-Committee was appointed by the Prime Minister in July, 1916.

The Committee recommend a scheme of State planting which in an emergency would keep the United Kingdom independent of imported timber for three years on a present day war basis of consumption. The total cost for the first ten years would be about £3,500,000 allowing not only for the direct cost of afforestation but for all incidental charges. Against this expenditure must be considered not the financial return on the capital, which, though certain, would be distant, but the sum that it has cost us during this war through the enormously enhanced prices of imported timber. *During 1915 and 1916 alone we paid £37,000,000* more than its pre-war value for the timber we imported. "Such a sum," say the Re-construction Committee, "would cover several times over any possible loss which could be incurred on a well-conducted afforestation scheme."

More important from a war point of view than cost was the amount of tonnage absorbed by these imports, which the Report states at 7,000,000 net tons of shipping, equivalent to approximately 14,000,000 tons dead weight. The proportion got from the empire fell from 22 per cent to 20 per cent in 1899. The practical utility of afforestation at home is proved by the fact that 90 per cent of our imports are the soft woods of coniferous trees which could be grown in this country.

The Re-construction Committee estimate that there are not less than three and probably more than five million acres of land utilised for rough grazing but capable of growing first class timber of the same character as that imported. Of this area 2,000,000 acres could be put under without decreasing the Home production by more than 0·7 per cent and it would ultimately give employment to at least ten times the number of men employed by grazing.

The Scheme which the Committee recommend proposes to afforest 1,770,000 acres. Taking eighty years as the average rotation, two-thirds of the whole should be planted in the first forty years. From the 15th year onwards the scheme would begin to provide pit-wood from the quicker growing species on the better kinds of mountain land. By the fortieth year the plantations made in the first ten years alone would contain enough timber to keep our pits supplied in emergency for two years at the present rate of consumption. The total cost for the first forty years may be £15,000,000. After that time the scheme should be self-supporting. The whole sum involved is, therefore, less than half the direct loss incurred during the years 1915 and 1916 through dependence on imported *timber.*

The report points out that if the Government should wish to employ the maximum number of men discharged from the service during the demobilisation, the rate of planting might be greatly speeded up. The Committee propose that at least 150,000 acres of the initial 250,000 should be planted direct by the State action, and that for the remainder (left to local bodies and private land-owners) there should be State assistance and control. "We do not believe (says the Report) that State afforestation means expensive and inefficient action. On the contrary we have the long experience of all the countries in which the afforestry has reached a high pitch of development, and the promising methods of management in certain of the Crown woods of recent years, to prove the opposite."

The Committee's scheme of the State control and management is to create a

special authority, a forestry Commission represented by a Parliamentary Commissioner in the House of Commons. The Commission would consist of six members, three of them whole time salaried officials, the others unpaid. There would be consultative committees for England, Wales, Scotland and Ireland.

For carrying out the scheme, forest officers, foresters and foremen would be required and would have to be trained. Forest officers would be inspectors engaged on survey, planting plans, supervisions of planting, and advisory and experimental work. It is estimated that the service would require sixty officers by the fifth year of operation. Probably twenty reliable men with a good knowledge of British conditions, would be available at the outset. These men would have to be university trained and the standard necessary is that represented by a good honours degree in science.

It is recommended that the forestry commission should undertake the general control of Forestry education, and must maintain "demonstration woods" for practical work.

The increase of population on the land under the Committee's scheme would be considerable. It is estimated that it would result ultimately in the settlement on the soil of not less than 25,000 families, or 125,000 persons in all.

The necessities of war govern the whole report. A few passages may be quoted from the general summing up of the military case for afforestation:—

"We have, to speak plainly, run risks against which every other considerable country has long taken care to protect herself."

The war has disclosed no demand which could not have been satisfied by timber grown in this country with its favourable soil and climate and abundance of waste land."

"It is only a question of time before the whole of the country's growing timber which is fit for commercial use must disappear. The result is depletion which the Government cannot afford to neglect. This country poorer in timber at the beginning of the war than any other European country except Portugal, will be more destitute still at its close. Even if acre felled is replanted it will be many years before the present output can be repeated."

ECONOMIC RECONSTRUCTION* A REVIEW.

By The Editor.

A couple of years ago, we noticed one of Mr. Peddie's books in this *Journal*. The present is, in some respects, a continuation of that. If that dealt with a "National System of Economics" the present one seeks for the application of its vital portion to the British Reconstruction work after the War. Mr. Peddie is a man of convictions. He does not mince words when the occasion requires it. When he urges that all sections of the body politic should harmoniously work for the good of the country, it seems to us that he has a correct view of the difficulties of the problem confronting us, whether in the political or in the industrial world. Mr. Peddie has no belief in Mr. Karl Marx and his doctrines: nor has he any the faintest suspicion that those who seek to apply them to the practical problems of to-day are foredoomed to fail. At the same time, Mr. Peddie is a confirmed disbeliever in Laissez-faire. "I believe with Colwell," he says, "that the extent to which Governments have gone, and must necessarily go in protecting and promoting industry, clearly contradicts the idea that men and business should be allowed to go their separate ways without regard to the general welfare of society as a whole." He thinks that there must be laid down for general guidance certain principles which should "run through and be the foundation of the laws of the nation," but subject to which each man may then "pursue his own interests in his own way." While the war has demonstrated, more than anything else, that the social ideal of internationalism can never be practical, the tendencies manifest

* *Economic Reconstruction*—by J. Taylor Peddie. Longmans Green & Co., London and Bombay. 6s. 6d. net.

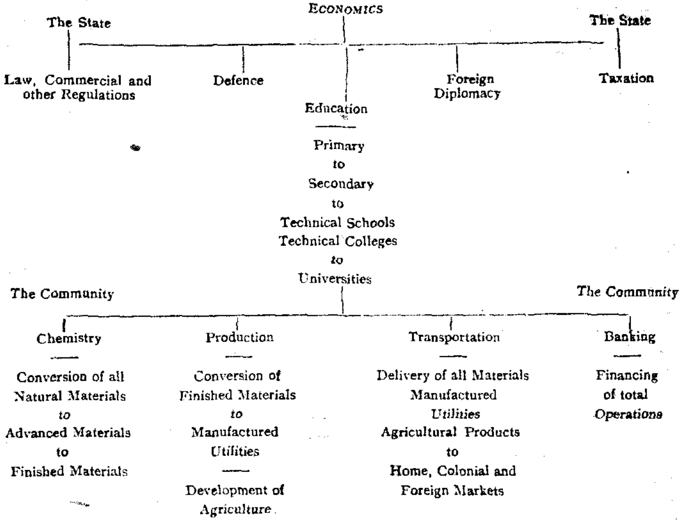
to-day do not confirm altogether Mr. Peddie's conclusion that the proletaria is not likely to push its theory to its logical conclusion. Mr. Peddie's central idea is that the best corrective to the German military aggressiveness and world domination is to develop the nation's productive power. "History has clearly demonstrated," he adds, "that nations have only been destroyed by being impotent in that respect." Mr. Peddie is apparently a business man and the reader will find that his suggestion is born of convictions deeper than were bookish theories.

Mr. Peddie's robust common sense repudiates the general unwillingness of the average Briton to recognize the economic factors embedded in politics. Politics, in his opinion, is nothing more than practical economics, in the truest conception of that term. Again and again, he reiterates this idea. We shall only quote a passage or two to make our position clear. He says at page 222:—"As a race, the British people comprehend the science of politics better than any other people, but they have failed to perceive that political science and Economic science go hand in hand and are inseparable; that in reality they constitute national power, and that, therefore, they should be instruments which our representatives in Parliament, and the Government, should employ with such wisdom and discretion as they may possess in advancing the higher interests and civilization of the race." Concluding a long quotation from Burke in which that great statesman expatiates on the wrong of Ireland, he says again: "Is it too much to expect that our modern politicians may take to heart Burke's simple doctrine; that they will not go to the House of Commons and regard politics as a great game, not look up on the lives and welfare of their constituents as pawns in the game? The Economic welfare of the citizens they represent should ever be their first consideration. Political science, which we contend embraces the economic as well, is designed for the good it can do to society, and for this reason it must ever be regarded as a means to an end. To look upon human beings as being mere fractions of a horse power, as constituent elements in a process or the development of a science of wealth and to use them as such, is, in our view, one of the greatest crimes that has ever been perpetrated upon humanity." Whether this is so or not, we need not pause to consider here; it is enough we note Mr. Peddie's view point. Much of it may sound good politics but is not economics. That, however, is a matter that does deter Mr. Peddie from offering his views, for, as we have already remarked, he has the courage of his convictions, and can quote even Adam Smith in support of his views.

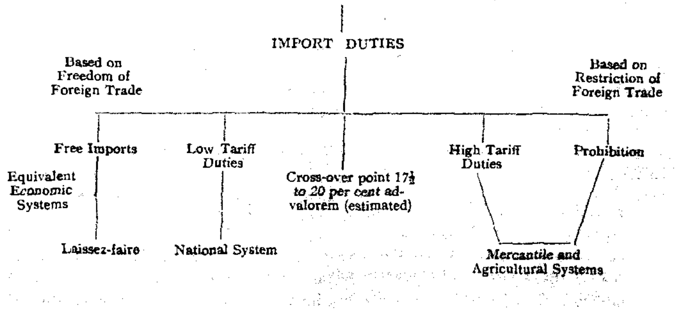
Mr. Peddie's general idea being what it is, it is not surprizing that his application to practical problems of to-day show a wide divergence with current notions on them. That is as it should be; it is valuable because it shows a side of the picture that is usually not perceived by most arm chair Economists and politicians. Mr. Peddie is seen to advantage in his chapters on capital and consumption of capital, on the redemption of the national debt, on art, economics and world politics and on Ireland and the National System. We would suggest to the interested reader that he should turn to the book itself if he wants to have some insight into Mr. Peddie's hard headed way of battling with these topics. He views them from the point of view of a business man bent on taking a comprehensive, not a partial or one sided, view of things.

Appended to Mr. Peddie's book is an interesting table indicating in graphic form his system of Economics—the system which he terms "A National System of Economics." We reproduce the same on the next page as it well illustrates the interdependence of several things that affect national well-being but which are commonly though erroneously thought of as forming separate water-tight compartments.

A NATIONAL SYSTEM OF ECONOMICS



N.B.—Each of the above headings can of course be very largely sub-divided.



ECONOMICS IN THE WEST.

Indian Industrial Conditions.

London, 13th February, 1919.—It is a curious fact that in the copious comments made in reference to the economic programme of the Peace Congress there is an almost utter absence of mention of Oriental industrial conditions. There are plans in plenty for re-modelling the European Industrial world, programmes beyond number for introducing an international millennium in which the working man will work a minimum number of hours for a maximum rate of pay. But not a suggestion that the whole subject is enormously complicated by the existence in half the world of standards and conditions of labour utterly incompatible with these idealistic schemes. How, for example, could you possibly, enforce a 40 hour weekly in India or pay a minimum £1 (Rs. 15) a day to workmen which are points in some of the Labour Charters seriously put forward? In no Eastern country could anything approximating to such conditions be enforced. If that be the case then how is the new International system to be introduced? To my mind the whole idea of international reputation of industry is utterly impossible unless you are to associate with it a method of coercion utterly repugnant to every notion of honesty and fairplay. In point of fact to achieve even the appearance of success there would have to be a boycott of Oriental goods in markets dominated by the League of Nations accompanied by repressive measures against shipping. At this time of day we are not in the least degree likely to see anything of this kind, I am certain, and so it seems probable that this whole scheme of international industrial regulation will be abortive.

At the same time Indian industrialists will do well to give heed to their ways lest they legitimately provoke some form of interference. It would be ridiculous to suppose that wages and conditions of labour in India can be levelled up to the European, still less to the American standard, but on the other hand there is no reason why Indian artisans should be housed like cattle and paid a mere pittance for their sometimes really skilled labour. Increased wages, lowered hours, improved living conditions might all be introduced not merely without detriment to the future of Indian industry but with positive advantage to it. The wide world over it is the experience that well paid labour is not in the long run costly. Where good wages are given the manufacturer gets a better return for his outlay in the shape of higher workmanship and increased output. In India improved industrial conditions would almost inevitably attract to the factories a better class of labour than has hitherto come forward in any volume. You would soon have in your country what we have here a solid useful class of mechanics capable of adopting themselves to new conditions and able to get the highest return out of machinery. I have no doubt that the recent labour disturbances in Bombay have opened the eyes of those concerned to the necessity for a new departure. They must have seen that India no more than Western countries can evade the obligations imposed by the situation left by the war. The barriers which once separated East from West by a profound division have broken down under the strain of a mighty conflict. As the Spanish influenza has spread to the uttermost ends of the earth from the battle area so has the spirit of a new labour dispensation. It is knocking at the doors of capital in countries widely separated with an imperiousness which will take no denial. Those who give heed to the warning summons will have no cause to regret the sacrifices they may have to make; but those who linger in the background under the shadow of the old system will most certainly be overwhelmed.

THE PROCESS OF RECONSTRUCTION.

Amid the continual rumbling of the labour machine under the influence of repeated strikes we hear little of the processes of reconstruction but progress is nevertheless being made and substantial progress too. Steadily, though unobtrusively, our war factories are being turned over to civil purposes and already—in some cases almost literally—the world is being converted into the ploughshare. In many instances the transformation is being effected with quite a minimum of trouble. Thanks to foresight in the early stages of planning and equipping these mammoth establishments which are dotted all over the country, they are now readily converted to new uses, while there is plenty of labour as a rule to work them. Some of them are being devoted to the useful work of replacing German industry in various departments in which she had a dominating voice before the war. In a series of highly instructive articles which the great midland organ, the *Birmingham Post*, has been publishing recently the public have been given a useful insight into some of the newer forms of enterprise into which the country's industry has been directed by the influences of the war. From these articles I gather that Birmingham has established a practically new industry in the shape of a brass stamping process. Here instead of moulding brass and turning the cast article afterwards the material is stamped or pressed to the immense saving of labour and metal by the reduction of work. The process was in vogue before the war, but it was largely from Germany that the brass mouldings were obtained. The war, however, had not been long in progress before our Government found the extreme value of the method as applied to fuse bodies and shell parts of all descriptions and they installed extensive machinery in the Birmingham district to produce the needed articles. So heavy were the calls upon the factories that one establishment alone produced 200 tons of stamping a week. Now the machinery almost without a visible effort is being employed for mouldings of a general character a wide demand for which is confidently expected. Another of Birmingham's gains by the war is a detinning industry. Here tinplate scrap and disused tins usually cast aside as useless are taken in hand, put through a process which extracts the tin and leaves the other metal readily to be dealt with as a valuable trade product. Before the war tins were exported to Germany in vast quantities for detinning, but this is not likely to happen again. The tin extracted from the waste is to-day worth £250 a ton. During the crisis of the war it fetched £360. A curious commentary on this is the fact that not long since manufacturers were accustomed to paying 5/- per ton to persons who would take old tin refuse away. I have no expert knowledge on the subject but it appears to me that there is room here for a new Indian industry. A plant established in a good centre—Bombay and Calcutta—would almost infallibly be able to attract to it a sufficient quantity of tin refuse to yield a good return on capital.

THE MAGNETO INDUSTRY.

The case of the magneto industry stands alone as a war created interest. In this letter I have referred to it before but I have no hesitation in returning to the subject because of its importance. When the war cloud burst we were in this matter as in so many others under the German thumb. We produced few magnetos ourselves and complacently allowed Germany practically to monopolise a manufacture which gave her the control of a vital part of motor machinery. Fortunately our scientists were equal to the call made upon them to produce an efficient substitute. One of the initial difficulties which had to be faced by the experts, says the writer I have referred to, "was the production of suitable metal for making the permanent magnets in which the armature revolves and sets up the voltage for

transmission to the sparking plug. Tungsten was what the Germans used for these magnets. Our own chemists had to find new alloy steels which would fulfil the same function. The research laboratory established at the Birmingham Council House by the enterprise of the Gas Department rendered valuable service in this quest, carrying out a great many experiments. Works were equipped in the midlands for giving effect to the scientist's discoveries and gradually the German magnet was replaced by a home production which is pronounced superior in its vital parts to the German made article. Moreover, we have made ourselves independent of the American magnets which was making rapid headway when the war broke out. "Magnetos are manufactured almost entirely in Birmingham, Coventry and Rugby. The combined output of all the firms at present engaged in the industry is about 30,000 a month as compared with about 100 before the war. And this is not all. Present production it is expected will be doubled in the near future for our manufacturers have now a complete grasp of essential factors and will not be content merely to satisfy domestic needs. Before the war Germany is believed to have exported 24,000 magnetos a month so that there is ample scope for the operations of this promising new industry.

IRON AND STEEL TRADE.

Amongst the certainties of the industrial future is a great boom in the Iron and Steel trade. In the world wherever you look there is evidence of coming huge demands of these indispensable materials. Railways are everywhere needing repair and equipment, bridges require to be built, shipping constructed, and a hundred and one needs in every department of life are craving for supplies of metal. How the increased demand will be met with supplies is one of the most interesting problems of the future. Great Britain during the war increased her steel production from 7,500,000 tons to 10,500,000 tons, but she only exported last year 1,617,000 tons against a pre-war shipment of 5,000,000 tons. The question is whether she will be able to sustain her record of construction and recover her lost hold on world's markets. If she is true to herself there ought to be no doubt on this point. Belgium which has been practically wiped out for the time being as a producer exported largely before the war; Germany had to her account an export of 6,000,000 tons and Austria was also a large competitor in the world's markets. There is here a large gap that has to be filled quite irrespective of exceptional requirements for reconstruction. But as far as Great Britain is concerned much turns on the labour question. If she has to pay inordinately for her coal and labour she will scarcely be able to meet the competition of rivals like the United States who are not so severely handicapped in these respects. Time will show to what extent British genius and capacity are equal to the difficult situation that exists. If I would hazard a prophecy it would be that a way will be found out of the present impasse and that in the end British industry will settle down to the new conditions with a determination not to be beaten. Meanwhile, the Indian steel trade has an opportunity which it will surely not miss. Her brilliant war record carries with it a suggestion of future possibilities which a few years ago would not have entered into the thoughts of the most optimistic. Her steel production, already respectable, will almost certainly grow to huge proportions if nothing untoward occurs to interrupt progress. But here as in Great Britain there is the intangible factor of unrest to make us cautious when we seek to estimate her chances of profiting by the position that has arisen in consequence of the war. In the main, however, the outlook is auspicious and we have reason to hope for the best in the growing sense of responsibility which pervades the best type of Indian thought and which is nowhere more conspicuous than in the ranks of industrialists.

ARNOLD WRIGHT.

INDUSTRIAL NOTES FROM THE UNITED STATES.

America's Huge Automobile Production

Washington, D.C., U.S.A., 10th March, 1919.—According to a report just made public, the total number of people employed in the manufacture and sale of automobiles in the United States aggregate 1,930,000. Of this total number 580,000 are in automobile factories, 1,020,000 make parts and accessories and 230,000 are employed by agencies and garages. This number equals 10 per cent of all the people engaged in mechanical and manufacturing industries of the United States.

The motor car business, therefore, supports more than 3,000,000 people. This population would fill a city half the size of New York, as large as Chicago, twice as large as Philadelphia, four times the size of Boston or New York, or ten times as large as Minneapolis, Los Angeles or Washington. It more than equals the population of California, Georgia, Indiana, Iowa, Kentucky, Minnesota, New Jersey, North Carolina, Tennessee, Virginia or Wisconsin.

The salaries and wages of those employed in the automobile producing industry aggregate nearly $800,000,000, of which the automobile factories pay $300,000,000; parts and accessories people $400,000,000, and the dealers and garages $100,000,000. These totals exceed twice the entire annual revenue of the United States post office and seven times that paid for the transportation of the mails.

Prior to the war the wages paid in the automobile industry exceeded the government's ordinary expenses and were equal to three-quarters of the government's ordinary receipts.

The total capital invested is $1,256,000,000 which sum is equal to the total outstanding capital stock of the nine greatest American railroad systems combined. Moreover, the investment aggregates three times as large as the outstanding capital stock of the entire Standard Oil group of 35 companies, and exceeds the capital of all the national banks at the end of 1917. During the year 1918 there were more than five millions of cars in use in the United States. At an average of about 1,000 miles per year, carrying say three passengers each, the total passenger miles covered would be more than 7,000,000 times across the continent and nearly 2,000,000 times around the world.

During 1918 the American railroads carried over 1,450,000 passengers, but to have equalled automobile mileage they would have had to carry each passenger at least 20 miles. The passenger miles travelled by automobiles exceeds those of street cars and steam railroads, and a railroad authority states that the seating capacity of motor cars is greater than that of railroads and street cars combined. He stated that there are 55,000 steam passenger cars in use, averaging 60 persons a car, or a total of 3,300,000. The total seating capacity of motor cars, on the other hand, is at least 25,000,000.

A Folding Hand-cart to Pass Through Doorways.

There has recently been invented a hand-cart which, when not in use, can be folded up to pass through any ordinary doorway. It is an idea which is attracting quite a little attention. The parts are framed together *in such a way that there is no need for* taking down or loosening any of the joints. The plan is to simply fold the bottom of the cart upwards and then the sides fold together carrying the wheels closer but still leaving them so that they will roll along and carry the cart. The framework consists of the sides with three cross-rails, each in two parts, hinged together.

The side pieces of the cart are shaped with hand grips on each end, and are finished with shaped blocks on the under side to

raise the body of the cart to a convenient height.

The axle for each of the cart wheels is forged. These pieces are fastened on the under side of the shaped block attached to the frame. The vertical part is long enough to extend over the frame piece. When locating the axle pieces they are placed opposite the centre of the middle cross piece in the frame.

When these ingeniously-constructed carts are extended out ready for use the sides are held apart because the bottom of the cart is a neat fit between the side pieces of the frame. For convenience the bottom is made in two pieces, each hinged to the side of the cart.

DOING RIVETING ELECTRICALLY.

The pneumatic riveter was a great invention. It expedited steel assembly work. But why do we still heat the rivets on a forge fire ? And the heater—why must he toss the heated rivet to a man twenty or thirty feet away from or above him, who must deftly catch it in a bucket? Why must the rivet be handled again, placed in the rivet hole, held in position while the riveter is set to work upon it, the rivet chilling every moment ?

Says an American Engineer : "I want to see the riveter place the rivet in position cold. On his pneumatic machine would be a spring device that would hold two or more carbons in electrical contact against the protruding rivet. The plunging or hammering function of the riveter machine would not in any way disturb the contact, because the spring part is attached to the hand part of the machine or the portion that is not in action. The wire would be attached to the riveter, and the other pole-wire to the dolly-bar or some solid backer against the riveting is done.

"Naturally, there are some details to study and difficulties to overcome. The current requisite to heat the rivet to the right point, the resistance, and such matters must be determined.

"Provision must be made for the protection of the operators, for relaxing the spring so as to remove contact for the last few finishing strokes, and for the best form of contact, which will have to be carbon, as far as material is concerned.

"Electrical rivet-driving would keep the rivet hot to the very last. The metal would be more malleable and would fill every unevenness of the hole. The percentage of poor riveting would be neglible.

"The points of contact are so close to each other, and the rivet is of so different a quality from the plates, that the current would naturally flow directly to the spot where it is wanted.

"Electrical heating will make a rivet so hot, so plastic, that I doubt if a riveter or hammer will be necessary. Simply heat the rivet to the right temperature and force it into position and shape. A sort of compressive action will be all that it will need.

"Electric riveting would mean comparatively little cost for current, infinitely greater speed, much better work, and the cutting off of two men to every machine."

TEMPORARY REPAIRS ON A LEAKY BOILER.

A temporary repair on a leaky boiler can be made by cutting out the leaking part ! Often this is the only way to avoid a long delay and a shut-down. Though the fuel expense is increased a bit, the saving until repairs can be properly made or new equipment received fully justifies the expedient. In the case of a sectional boiler, it may be found that a section has sprung aleak through a sand-hole right over the grates. No kind of plug will keep the water off the fire, but by cutting out the mud drum and steam connections and screwing in plugs, the other part of the boiler may be operated as before.

With a leaky tube in a boiler that furnishes steam for power, it is often impossible to shut down during the week long enough to put in a new tube, but a taper plug may be driven in each end of the tube any night ; then,

f these are made with a hole through the :entre and a rod long enough to pass through oth and allow a nut at each end, the plugs nay be kept securely in place until ermanent repairs are made. Such repairs are not to be encouraged; but, in these days of unusual delays and high production, they help greatly in a pinch, and if well done and he boiler is carefully watched they can do io harm.

HANDLING HOT LIQUID STEEL.

It is conceded that the most difficult and angerous problem in the large steel mills is he handling of the intensely hot liquid steel fter it is made in the steel-furnaces. Contact with it means certain and instant eath, and there is also danger of fire at all mes from the metal.

After it is ready to be tapped from the urnace in which it is melted into a red-white nolten mass and purified, the metal is llowed to flow into a large pot or ladle. These receptacles are suspended from traveling electric cranes. The ladle holds about fty tons of liquid steel.

After it has reached this ladle it must be ransferred to the molds—a dangerous and xacting operation. In order to do this the ed-hot liquid metal is allowed to flow from a ole in the bottom of the ladle, and this hole s opened and closed by a lever. This lever a specially designed piece of mechanism which is attached to the outside of the ladle, nd which raises and lowers a long stopper r plug inside the ladle and attached to the rms of the lever reaching over the top of e ladle's side.

IE NEED NOT GO IN WHEN IT RAINS.

A motorist will not make for the nearest arage or other protection when it rains, for s seat within the car protects him from ctual contact with the rain. But riders of cycles and motorcycles have no protecting overs and are unmercifully soaked by sudden ins. The result is that they must seek elter, and continue their journey only when e weather gods see fit to permit it. This unpleasantness in cycling has been overcome by a recent invention.

Cycling enthusiasts have every reason to welcome the combined cycle raincoat and cover for which a patent has just been issued in Washington. The waterproof coat is large enough to cover not only the rider, but also the handle bars, pedals, driving mechanism and saddle of the wheel. A high collar, which may be turned up and fastened in that position, fully protects the head and neck of the rider.

The coat opens on the side, and is held together securely by snap fasteners. The closing seam of the garment is made water-tight by providing for two flaps on one edge, between which the other edge is placed when the coat is buttoned. The coat has no sleeves. To enable the wearer to unbutton the fastenings a side opening, protected by a flap, is provided. The front part of the roomy and tent-like garment fully covers the handle bars and is attached to them and to the front fork.

While most highly serviceable there is nothing complicated about this rain-coat garment. It is easily put over the shoulders of the rider, and the driving and steering mechanism of the wheel and as readily and quickly fastened to the front fork and the handle bars. The rider can, with but little effort, get out of the garment without detaching it from the machine.

WITH THIS SAW ONE MAN DOES THE WORK OF TWO.

In structures of various kinds it is often necessary to cut piles, stringers and other timber after they have been put in place. Frequently, the sawing has to be done in places difficult to reach, and under conditions that make the handling of the saw extremely difficult and awkward. It required at least two men to do the work with the old-fashioned cross-cut saw, and it was slow work at best.

The recent invention of a cross-cut saw which can be operated by one man is of

considerable importance and value, especially at the present time. This device consists of a light steel frame which is clamped in position against the tree, pile or poes to be sawed. The saw-blade, which is pressed in contact with the wood by a string, is attached to a slidable rod which is moved back and forth by an upright lever worked by hand. The mechanism is extremely simple and cannot easily get out of order.

The method of operating this saw makes it possible to use it in places and under conditions that would preclude the use of the old-style saw. Trees may be sawed close to the ground, which means an appreciable saving in lumber. Piles may be cut flush with the cross timbers of a dock or pier, and in the case of necessity it is even possible to saw piles or posts under water with this ingenious saw.

The saw can be adjusted as to pressure and length of stroke, and one man can easily do twice the work that two men can accomplish in the same time with one of the old-fashioned cross-cut saws.

A Home-made Air Pump for Auto Tires.

Inflating tires quickly while on the road may be accomplished by the well-known method of using one of the engine cylinders as a compressor. To take the place of the spark-plug on one cylinder—preferably the one in the rear—make a connection for the air hose, using a nipple having the same thread as the spark plug, and on this turn an ordinary pipe coupling. The spark plug is turned into the upper end of the coupling. This provides a means of tapping the coupling for a side outlet, into which are fitted a small brass cock, a ball check valve, and finally the hose connection.

When it becomes necessary to pump a tire connect the hose with the check valve to the cock, turn the valve, and let the engine run.

Alfred T. Marks.

NOTES.

The Progress Report of Forest Administration in the Punjab for the year ending the 30th June, 1918, in the chapter relating to research and experiments, says that the Himalayan spruce and silver fir are being tested as to their suitability for aeroplane manufacture; and for this purpose a large number of trees have been cut in Bashahr, and a consignment of timber despatched to the Aeroplane Factory at Lahore. Expert opinion on this consignment is awaited. It has been found very difficult to get any large quantity of timber sufficiently free from knots. In connection with this work the question of the so-called "red heartwood" of the spurce has come prominently to notice. This "heartwood" will not float, and has to be left in the forests; and as it is present in large quantities it seriously affects the yield of the forests. Its origin and character have been proposed for investigation by the Forest Research Institute. Walnut timber extracted from Bashahr for trial in the construction of aeroplane propellers was pronounced by experts to be unsuitable for that purpose when converted green. Several species of moss found in Bashahr have been tested as to their suitability for surgical dressings. One species is well reported on by the medical authorities; and experiments on a large scale are being made with it. Experiments in Kangra have shown that the coppice felling of ban oak (*Quercus incana*) in that division can be carried out at any time of the year without any difference being discernible in the vigour of the resulting shoots, and further that it is unnecessary to dress the stools, since practically all the shoots come from dormant buds and not from the cambium layer. Two sample plots have been laid out in Kangra to ascertain the correct rotation for cutting bamboos and the degree to which clump-clearing

should be done. In Lahore the experiments regarding the fertility of shisham seed obtained from coppice shoots, and the efficacy of early thinnings in irrigated plantations are being continued. The Burmese species of bamboos, mentioned last year as having been tried in Kangra, have not so far done very well. A further supply of seed obtained from Burma this year failed to germinate at all. Of the various exotics tried at Dharmasala Spanish chestnut, *Cryptomeria*, *Robinia Acacia dealbata* and camphor—none can be regarded as successful. Robinia continues to do very well in Simla. It is particularly useful for clothing unstable slopes where excessive weight of trees is undesirable. The various species which were tried in Changa Manga as substitutes for shisham standards were all frozen down and failed completely.

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We note from the Report on the Administration of the Central Provinces and Berar for the year 1917-18, that the post of Director of Industries was separated from that of Director of Agriculture, and the former officer was appointed Provincial Controller of Munitions in addition. His chief duty in the latter capacity was to co-operate with the Forest Department in the exploitation of tanstuffs and lac and to endeavour to improve the indigenous tanning industry. A Tanning Expert has been appointed, whose primary function will be to secure the better flying of hides and their better treatment in the existing small tanneries. Plans have also been made for re-organizing the big slaughter-houses in the north of the Province, and it is hoped that they will become the source of supply of a large local up-to-date tannery. The Textile Expert, after very hard and up-hill initial work, has succeeded in introducing large numbers of improved looms among the local handweavers, which add at least 50 per cent to their daily outturn. He has demonstrated also that the wool of the local sheep can be utilized for a high quality of home-spun tweeds and that there are great possibilities of establishing an extensive cottage industry of spinning wool yarn to supply a weaving factory. The experimental factory has already been taken over by a local business man, and the expert if arranging to carry his experiments further so as to render this nascent industry, which is at present dependent on Cawnpore warp, self-contained and self-supporting.

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We take the following from the Annual Report on the working of Co-operative Societies in the United Provinces of Agra and Oudh for the year 1917-18 :—Co-operation among the small trading and artizan classes cannot be said to have taken root yet. Their position and outlook are different from those of the agriculturists. Their professional skill is a permanent asset, and loans and credit have, therefore, not the same value with them as with the latter. They are consequently more lax in their dealings in money matters. They are, moreover, content to work for others, as long as they get a living wage, by sheer habit of generations, and find it more convenient to borrow from their employers whom they repay in kind, than to have the botheration of organizing their resources. The comparative ease, too, with which they can change their stations militates against their position as good members of societies. For all these reasons these classes will require a great deal more of teaching and organizing than the agriculturist, before they can appreciate fully the benefits of co-operation and profit by it. My predecessor indicated in the last year's report that this problem could only be tackled, in the existing circumstances, by departmental staff specially allotted to the task. The last Provincial Conference also discussed the matter and decided that a special organizer with commercial experience was needed to educate and organize urban

societies. The matter is under the consideration of the Government at present.

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The following statement compiled in the Department of Statistics, India, shows the quantity and value of cardamoms imported from foreign countries by sea into British India during January, 1919:—

Article and countries of consignment.	January, 1919	
	Quantity	Value
SPICES.	Lbs.	Rs.
Cardamoms—		
From Ceylon ...	1,248	895
,, Turkey, Asiatic...	119	120
Total ...	1,367	1,015

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Turpentine oil and rosin are already being produced on a commercial scale in India by the distillation of pine rosin. A new source of supply, which though comparatively small may be valuable, especially for Indian use, has now been found in Indian frankincense or olibanum. This material is obtained by the natives by making incisions in the stems of *Boswellia serrata*, a tree widely distributed throughout the dry zone forests of Central India. The resinous substance which exudes from the cuts contains a kind of turpentine, a resin and a gum. Investigations of the methods of separating these constituents in a marketable form, as to their commercial uses and value and on the methods of tapping the tree, have been conducted since 1912 by the forest authorities in India in co-operation with the Imperial Institute, the results of which have been published recently in a paper by R. S. Pearson, Forest Economist, and Puran Singh, Chemical Adviser at the Forest Research Institute, Dehra Dun. The general conclusion reached, based on the results of numerous trials carried out in India and in this country by the Imperial Institute, is that the turpentine oil is equal to good quality American turpentine oil and that it could be used in place of the latter in the manufacture of paints and varnishes. The Imperial Institute has also reported that the rosin would be quite suitable as a substitute for pine rosin (colophony) in the manufacture of varnishes, being equal in value to grade "G" of American rosin.

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A lengthy paper on the treatment of cotton seed for commercial purposes was read in mail week before the Royal Society of Arts, London. A considerable part of the paper dealt with the potential value of the Indian cotton-seed crop. So far as any systematic utilisation of this crop is concerned, the author of the paper pointed out that the position now was the same as that summarised in the following statement made in 1917:—"The total area under cotton in India has been of late nearly 23,000,000 acres, and the total estimated output of cotton from this acreage is 4,500,000 bales of 400 lbs. each or about 800,000 tons of cotton. From these figures the quantity of seeds produced during the year may be roughly calculated on the basis of 30 per cent lint and 70 per cent seeds, which amounts to 1,870,000 tons. The amount of seeds required for agricultural purposes would be, at the rate of 14 lbs. per acre, about 100,000 tons, leaving about 1,750,000 tons for feeding cattle and for crushing. In 1901, when Indian seeds were first introduced into England, there were then produced in India 1,260,000 tons of seed. This huge quantity of seed was practically wasted."

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The author of the paper remarks that he has gone carefully into the matter, and assuming that only 1,500,000 tons of seed per annum are potentially available in India for crushing, and that the residual fibres on such quantity are properly turned to account,

the average Indian cotton-seed crop should have a market value, under pre-war trading conditions, of certainly not less than 18 to 19 crores of rupees (£12,000,000 to, say, £12,500,000). After deduction of the costs and expenses of treatment (above 2 crores) this works out to a return of about 106 rupees (about £7) per ton of seed. So far as I have been able to gather, the average price of cotton seed up country in pre-war times did not exceed 45 rupees (about £3) per ton. Hence, the nett loss in revenue owing to the absence of a fully developed crushing industry may be put at £4 per ton of seed, or £6,000,000 per annum as a minimum figure. Doubtless, were 1,500,000 tons of cotton seed milled scientifically in India, and the products dealt with in the light of modern knowledge and experience, the actual nett loss in revenue would prove to be much higher than £6,000,000 per annum.

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A resolution on the report on the Public Instruction in Bengal for 1917 says that two-thirds of European officers of the Indian Education Service has been detached for duty in the Indian Army Reserve of Officers in addition to officers on deputation to the Government of India or the University of Calcutta. The growing demand for education among the people of Bengal and natural growth of population led to an increase in the number of educational institutions. Of the scholars nearly two millions were in various stages of education, there being approximately one girl at school to every five boys. The total expenditure on education amounted to 255 lakhs. The number of arts colleges in Bengal increased to 34 or one-fourth of the total number in British India and there is a persistent demand for more. Altogether 25,265 students were reading in different colleges including one hundred and ninety-one ladies. Nearly one-third of the total number were Brahmins, while under one-tenth were Mahomedans. There was an addition of fifty-one high and middle English Schools, while middle vernacular schools decreased by 35. The total number of boys attending primary schools was nearly 1,183,000. The number of Hindu pupils in primary schools fell by 1,000, and Mahomedans under instruction outnumber Hindus by 35,000.

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A recent Mysore Government Order states:—The stocks of food grains (in pallas) according to the census taken on the 10th December, 1918, were as follows:—

Rice	Ragi	Jolam	Navane
3,06,493	15,78,874	1,51,191	36,044

The new harvest has been estimated to yield (in pallas).

Rice	Ragi	Jolam	Navane
12,89,134	30,77,817	7,79,470	1,78,416

The total quantities (in pallas) of the several grains thus available for consumption are as follows:—

Rice	Ragi	Jolam	Navane
15,95,627	46,56,691	9,30,661	2,14,460

From the above figures it will be observed that the supply of food grains available in the State would be sufficient for only 7 or 8 months at the most and that it cannot possibly last till the next harvest. To meet the deficit, it is absolutely necessary that suitable measures should be adopted. The necessity for conserving and making economical use of the available supply of food stuffs should be brought home to the minds of the public. It is necessary to import rice and broken rice from outside to supplement the existing stock and Government have already taken action in this direction. It is also very necessary that immediate action should be taken to stimulate the cultivation of quick growing crops. The Revenue Commissioner will be good enough to submit definite proposals in consultation with the Director of Agriculture who has already taken steps in this behalf as to what further measures should be adopted towards this end.

The following table, published by the Department of Statistics, India, shows the imports of tobacco (distinguishing the various descriptions) from each principal foreign country into British India in the month of January, 1919 :—

Countries of Consignment	Unmanufactured	Manufactured			Total Tobacco
		Cigars	Cigarettes	Others	
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
United Kingdom	1,785	266	375,178	63,037	440,266
Gibraltar	...	27	...	...	27
Aden and Dependencies	...	...	848	165	1,013
Ceylon	3	2	3	1	9
Straits Settlements	1,708	14	22,866	405	24,993
Australia	...	...	102	19	121
Natal	...	...	827	160	987
East African Protectorate ...	...	...	20	206	226
Turkey, Asiatic	34,944	874	...	...	35,818
Muskat Territory and Trucial Oman...	30	...	...	...	30
Persia	38,768	...	...	...	38,768
Philippines	...	2,754	16	...	2,770
China	26	...	...	92	118
Sumatra	27,385	...	...	...	27,385
Egypt	...	...	1,270	...	1,270
Portuguese East Africa	...	...	30	...	30
United States of America ...	10,235	328	37,495	52,352	100,410
Total ...	114,884	4,265	438,655	116,437	674,241

Duty realised on imported tobacco in January, 1919, was as follows :—

	Rs.
Tobacco, unmanufactured ...	14,181
manufactured—cigars and cigarettes ...	8,21,955
manufactured—other sorts	1,02,432
Total Tobacco ...	9,38,568

To encourage the essential oils and perfumery industry in Italy the following concessions have been granted by Decree No. 1915 of 17th November 1918, published in the "Gazzetta Officiale" of 26th December, says the *Board of Trade Journal* :—(1) Cultivators of flowers for essential oils and perfumes are exempted from land tax for ten years, and in certain cases, from income-tax on the proceeds of such cultivation for five years. (2) Italian manufacturers of essential

oils from oils and herbs, and manufacturers of perfumes are exempted from (*a*) customs and octroi taxes on machinery and building materials, (*b*) from Income-tax for five consecutive years, and (*c*) from taxes and supertaxes on their building for five years.

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A Paper entitled "Cholam (*Andropogon Sorghum*) as a Substitute for Barley in Malting Operations" by B. Viswanath, T. Lakshmana Row, B.A., and P. A. Raghunathaswami Ayyangar, Dip. Ag., Assistants to the Government Agricultural Chemist, Madras, has just been published as No. 4 Vol. V. of the *Memoirs of the Department of Agriculture in India* (Chemical Series). Price As. 12. The paper deals with the investigations carried out with the object of finding a satisfactory substitute for barley from amongst the common South Indian cereals. The following obtained from the Central Farm, Coimbatore, were examined for their malting capacities: (*paddy* (*Oryza sativa*), *cholam* (*Andropogon Sorghum*), *ragi* (*Eleusine coracana*), *tenai* (*Setaria italica*), *maize* (*Zea Mays*), and *cumbu* (*Pennisetum typhoideum*). "From a consideration of the foregoing results," the authors conclude, "we feel justified in concluding that *cholam* may be used wholly or partially as a substitute for barely in malting operations. The absence of a sufficient proportion of husk in the grain is perhaps a disadvantage with *cholam*, but this defect can possibly be remedied by admixture with malted paddy or bran. *Cholam* is much cheaper and more largley available in India than barley and can, therefore, be used extensively. Foods of the types of Mellin's food, Horlick's malted milk, malt extract, and beer were prepared by us in the laboratory and submitted to the Madras Exhibition of 1917. The details of the methods of preparation and the nature of the apparatus used are being published as a separate paper. The results obtained so far may be summarized as follows :—(1) *Cholam* is better suited for malting purposes than the other common South Indian cereals experimented with. (2) *Cholam* malt extract hydrolyses soluble starch at a greater rate than barley malt extract. (3) In the case of hydrolysis of starch by *cholam* malt the proportion of dextrine to sugar produced is greater than in the case of barley malt compared under identical conditions. (4) The products of starch hydrolysis by *cholam* malt consist, as with barley malt, largely of maltose and dextrine."

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A "Preliminary Note on the Seasoning of some Indian Timbers, by Natural Methods" by Mr. R. S. Pearson, I.F.S., F.L.S., Economist at the Forest Research Institute, Dehra Dun, has just been published as Part I of Volume VII of the *Indian Forest Records*. The author states :—" A considerable amount of information is available as to the methods of seasoning a few of the better known timbers of India, such as Teak, Sal, Deodar, etc., though little information is to hand in respect of the many valuable hardwoods, other than the above. It was therefore thought advisable to start an enquiry in 1914, with a view of ascertaining the best methods of dealing with certain important Indian hardwoods, and as a commencement 33 species were selected for testing. The results obtained have been of sufficient importance to justify an immediate extension of the enquiry on a much larger scale. At the time the experiments were initiated some doubt existed as to whether sufficiently definite results would be obtained to justify conclusions being drawn as to the correct methods of seasoning the different species of timber. In the majority of cases, however, excellent results have been obtained : a glance at the records given in Appendix IV, against such species as *Bombax malbaricum*, *Duabanga sonneratioides*, *Dillenia pentagyna*, *Diospyros Melanoxylon*, *Lagerstraemia Flos-Reginae*, *Terminalia belerica* and many others will fully support

this assertion. In the case of such timbers as *Dalbergia Sissoo and Dalbergia latifolia*, both timbers of excellent quality, which rarely split seriously while seasoning, the difference in results obtained by seasoning the timber in various ways is not so marked. In the sase of *Bassia latifolia, Grewia tiliaefolia* and *Xylia xylocarpa* (Indian) very satisfactory results were not obtained, when seasoning according to the methods adopted, though some methods gave distinctly better results than others, while in the case of *Anthocephalus Cadamba* the results were negative in every instance. The results show that the number of species which should be either girdled, or the timber converted from green logs with or without subsequent immersion in water, is about equal, and that 94 per cent of the total number of species tested must be treated either according to one or other of these two methods. Natural seasoning in the log, with or without bark on, in the shade or in the open, and with or without ends treated with a coating of any protective substance, has only given beneficial results with high quality timbers, such as *Dalbergia latifolia, Ougeinia dalbergioides* the *Albizzia* spp., etc. The experiments throughout indicate the great importance of careful stacking of timber, on level ground, with free circulation of air round each piece. Without wishing in any way to labour this point, it may be said that satisfactory results cannot be obtained without proper attention being paid to this work. It is also advisible to break the stacks and turn the timber, if left for more than three or four months in one place, this being especially necessary in damp climates. In some of the experiments, as for instance those carried out at Sukna in Kurseong and at Dandeli in the North Division, Kanara, the timber after conversion was stacked in the open, under the shade of trees, both places having a heavy rainfall. This resulted in the timber of certain species being heavily attacked by fungus and in all cases resulted in undesirable discolouration of the timber. At Allapilli in the South Chanda Division, the timber was stored in a suitable shed, with very beneficial results, which fully justified the extra cost. Though permanent seasoning sheds, entailing a somewbat heavy initial expenditure, are no doubt justified in certain cases, it is quite feasible to erect quite temporary shelters in other cases, the cost of which will be more than repaid by the higher prices realised for the timber." The publication is priced at Re. 1 and copies can be had of the Superintendent, Government Printing, India, 8, Hastings Street, Calcutta, or from any of the agents for the sale of Government of India publications.

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Last month we published a Mysore Government order directing the grant of certain concessions for the encouragement of the cultivation of Sisal Hemp in the State. Government have now supplemented that order by another one approving the rules suggestsed by the Revenue Commissioner in Mysore in regard to grant of lands under the first order. These are :—

(1) In the case of unassessed kharab lands not reserved for any special purpose and in respect of which there is no objection on the part of the villagers, the Assistant Commissioner in charge of the Taluk may grant the lands free up to a limit of 50 acres recovering only the cost of trees or other malki on the lands.

(2) The Deputy Commissioner may similarly grant such lands up to 100 acres. In the case of assessed lands or lands set apart for special purposes, the Deputy Commissioner may at his discretion grant the lands up to 50 acres, if he is satisfied that there

is no reasonable objection to the grant.

(3) All other cases may be sent up to the Revenue Commissioner for sanction.

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An important development in the United States silk industry, if climatic conditions are favourable, was recently announced in the press, says the *Board of Trade Journal*. So successful, it is stated, has the Austin Silk Plantation and Manufacturing Company been, that it has just increased its capital stock from 12,500 dols. to 500,000 dols., and changed its principal place of business from Austin to Houston. This company began the culture of silkworms and the production of silk near Austin about three years ago. It is stated that the company has acquired a tract of more than 300 acres of land near Houston, which it will plant in mulberry trees for the propagation of silkworms. The production of silk and its manufacture on an extensive scale is to be developed as rapidly as possible, according to the promoters of the project. It is announced that the silk farm near Austin will continue to be operated. It is not stated how much of this capital is devoted to sericulture.

A new class for the degree of M. A. in vernacular in connection with the Calcutta University will be opened on the 15th July. The study of vernacular has not hitherto found a place in the curriculum for the degree of M. A. and the innovation will be watched with great interest. The new class will prepare candidates for examination in the following twelve vernaculars:—Bengali, Hindi, Guzerati, Ooriya, Assames, Marathi, Canarese, Malayalam, Tamil, Telugu, Maithili and Urdu. The text books for the different vernaculars have already been prepared and the requisite staff of professors appointed.—*P.*

GLEANINGS.

A machine called the schematograph has been invented to detect defects in the human form. A description of the machine appears in *Popular Science Siftings*, which says:—"The schematograph is merely a means of registering in outline form the natural figure in various poses, all calculated to show the ordinary defects coming from faulty posture. The whole idea of the machine is to show the subject, graphically, the physical defects as indicated by his or her posture." The device is as follows: An oblong box, about the size of a large camera, the bottoms side and ends made of wood, but the top with a sliding cover made of ground glass, a triple lens mounted in the front is an important feature of this machine. Inside the box, at the end opposite the lens, a reflecting mirror is mounted at the angle of forty-five degrees. The purpose of this mirror is to catch the rays from the image on the lens and reflect them to the ground glass over above, where they can be observed by the operator. The "operating room" is long and narrow. A black screen about seven feet high stands against the wall at one end. Some twelve feet from the screen hangs, a thick black curtain. Behind this the operator is posted, only the lens of the cammera protruding through the curtain. This arrangement serves the double purpose of shutting off all rays of light and in securing complete privacy to the subject. To make a schematogram, as the tracing is called: the subject undresses and mounts, a miniature model's throne in front of the screen. The operator focuses the machine, with the lens directed about at the subject's waistline. Just about and in front of the subject, two powerful electric lights are switched on to make the outline as clear as possible. On the ground glass at the top of the machine is clearly visible the image of the white figure, standing out against the dark screen.

If the image is satisfactory, the operator ays a thin sheet of paper over the glass and traces the outline; and if it is not, images are taken from various poses to locate the defects.

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Dr. Charles Edward Nammack is an American physician with a large private practice and the supervision, when ill, of members of the police force. As all the world knows, influenza has been epidemic in U. S. A. In Dr. Nammack's opinion uncomplicated influenza does not kill unless injudicious attempts are made to relieve pain by opiate dosing, or to reduce temperature by coal-tar products. He is convinced that every death certificate which gives influenza as a cause of death is a confession of failure to find a complicating broncho-pneumonia. He urges that coal-tar products are responsible for more deaths than influenza. "Influenza demands isolation, ventilation, elimination, and sustentation. Only these, and nothing more." If the patient insists on more, he orders a combination of ammonium carbonate, grs. 5, to facilitate expectoration, ammonium salicylate, grs. 5 to mitigate pain with the least depressing effect, and aromatic wine of erythroxylon coca, one-half ounce as a nerve stimulant and muscle invigorator.

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The fourth meeting of the education section of the U. P. Board of Industries was held at Lucknow on 11th March, 1919. Amongst other matters which came before the Board, a proposal to open a school of Calico Printing and Dyeing at Farrukhabad, had to be postponed, owing to the unavoidable absence of Mr. Kunji Lal Sadh, who made the proposal. The question of arranging for the training of disabled soldiers was also discussed, and enquiries are being made as to the number of men belonging to these Provinces, who are desirous of obtainnig training and the class of industrial work they have a preference for. The construction of extra building for the School of Arts and crafts, Lucknow, was recommended by the Board.

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In view of the unfavourable seasonal conditions prevailing in the State, the Government of Mysore desire that the touring officers of all Departments should watch the condition of the people in places visited by them and report to the Deputy Commissioner of the District and the Food Controller, any symptoms of distress that may come to their notice. In serious cases a copy of the report may be submitted direct to Government.

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In the year 1890, the value of the output of pulp and paper industry in Canada was $3,633,257; in the year 1915 this output had grown to $40,348,021; thus in 25 years it has become 11 times greater than what it was but three decades ago. No wonder paper manufacture is going up in Canada, and there is a lesson to be learnt by us all in Mysore from these figures.

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The Government of Mysore have extended the Collecting Savings Bank scheme into Mysore City and Bowringpet (including Kolar Gold Fields.)

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A notification in the *Gazette of India* of the 22nd March announces the removal of the prohibition on the export of pearls from British India.

The appointment of a Chief Conservator of Forests has been sanctioned for the Madras Presidency. Mr. S. Cox, at present Conservator of Forests, Northern Circle, has been selected for this post. He will take charge of his new duties on the 1st June. His Head-quarters will be at Madras. He will assume the position at present occupied by the Board of Revenue as head of the Forest Department and will exercise all its powers and duties in that respect except such as may be reserved to Government or to any other authority.

SPEECHES AND PRONOUNCEMENTS.

THE INDUSTRIAL OUTLOOK IN ENGLAND.

Sir Albert Stanley, President of the Board of Trade, made the following speech at the annual dinner of the Hudders-field Incorporated Chamber of Commerce. He spoke in acknowledgment of a toast of "The Board of Trade." We take the report of the speech from the *Board of Trade Journal*, dated 30th February 1919 :—

Sir Albert Stanley said it was almost exactly two years since he made his first and only other visit to Hudders-field. He remembered it very well indeed, because at that time it was only a few days after he had, in an almost thoughtless moment, accepted the invitation of the Prime Minister to the distinguished office he held, and at that time there was a very pressing problem engaging the attention of the Board of Trade. He found this problem as one of the legacies to which he became heir, and it was because of that problem that he came to Hudders-field. In the exuberance which a long experience of business life had taught him—for many years it had been his privilege to have a good deal of personal authority and responsibility, and to be in the fortunate position of being able to give a decision and dispose of trade problems—he referred to the problem of the development of the dyeing industry of this country as an easy problem. He had thought that it only needed discussing to arrive at a decision, and that speedy and successful action would be taken. He must confess to-day to some measure of disappointment. What he had hoped had not been yet materialised to the extent he had hoped for, but he would like to take the opportunity of conveying to Sir Joseph Turner, Mr. Norton, and Mr. Levinstein, and those associated with them in British Dyes, the thanks of the Board of Trade and his own personal thanks for what they had been able to do in advancing the interests of that most vital industry under exceedingly difficult circumstances. He was again at Hudders-field after two years, and he hoped that now they were about to see the results of their efforts during that time, and that they had now finally succeeded in establishing upon a firm and secure foundation one of the most vital industries of the country, securing its establishment so that it would be capable of not only meeting the needs of this country, but of taking a prominent place in the open markets of the world. They (the Board of Trade and the Government) were keeping a very watchful eye upon it; they were very much interested in their trade, and he did not suppose they would be disappointed with the progress made from now onwards.

A SLOW RECOVERY.

Just as the Government were keeping a watchful eye upon the dyeing industry, so, too, were they, in this critical time, keeping a very watchful, he might say a very anxious, eye upon all the industries of the country. As they reviewed the situation to-day, they were unable to find that satisfaction with the condition of the trades of the country that one might have expected to find. It was of the first importance that they should see, in so far as it was possible, that opportunity for employment should be given to all of our men as they were returned from the Army. Yet there was the fact that, so far as they could see at the present time, the trade of this country was not making that advance which they might reasonably have expected; there was not that life and vitality in the industries that might have been expected. It made one apprehensive when one came to consider the employment of the vast number of men at present in the services. It would, perhaps, be unwise that he should unduly exaggerate this position. No doubt as good many, perhaps like himself, after the strenuous occupation of the last four-and-a-half years felt the need of a short holiday, but whatever the reasons might be, more than two months had now gone by since the armistice was signed, and he personally would be much happier if he could see stronger indications of the development of our trade upon a firm basis than he could see at present. So they must look about and ask themselves, every one of them, in the Government or out of it, what were the causes, if there were any, which were impeding the proper development of our trade.

AN EMPTY WORLD.

It would surely be agreed by everybody that there was plenty of trade in the world to be obtained. After four-and-a-half years of, in some instances, complete cessation of trade, of enormous devastations created by the war, it was no exaggeration to say that we had before us practically an empty world remaining to be re-filled. The demand was there, it would be agreed, and he thought they must look for reasons why that demand had not been met with a greater measure of enterprise. They should first look at home and see if there was anything the Government could do which they had not done, or anything they had done which should be undone.

THE REMOVAL OF CONTROLS.

First of all he might take for consideration the question of the controls—the restrictions which had been placed upon our trade during the war. It was the deliberate policy of the Government that these controls should be removed as rapidly as possible. Obviously this could not mean in every instance that they should lock the doors of these control departments and throw away the keys; that, he was sure, would be a mistaken policy. Oddly enough the experience they had during the last few weeks in their efforts to remove these controls was that they had met with almost as much opposition to their removal as they met with when they were first established. They had removed already a good many of the restrictions affecting exports, but the restrictions upon exports must be maintained with respect to those things that were vital to our existence, and we must maintain the blockade until we had secured the peace for which our gallant men had fought. That blockade involved more than the placing of a restriction upon the exports to enemy countries—it affected countries bordering upon enemy countries. So far as they could, consistent with the maintenance of the blockade, it was the intention of the Government to urge—and if possible to secure the co-operation of our Allies to that end—the restoration of the trade of those countries which were not enemy countries.

PRIORITIES AND SHIPPING.

The Board were proposing, too, that the system of priorities should be brought to a speedy end, and he was hopeful that it would be possible to arrange that no more priorities should be issued except under very special circumstances, and that the priorities now in existence should be brought to an end some time in the early part of March. As to the shipping question, there was to-day more shipping available than we had cargoes to carry, and it was expected that in the summer of this year there would be at least as much tonnage afloat as existed prior to the outbreak of war—he was referring, of course, to the world's tonnage, and not to British shipping alone. It would take a few months longer before British shipping had reached the maximum of tonnage which obtained before the war, but it was at least very satisfactory to know that, so far as shipping was concerned, traders need have no fear now of any lack of facilities for bringing goods to this country or taking them away. He thought we might look forward in the very near future to a big slump in our shipping rates. There were very few raw materials inadequate for our needs. So far as essential raw materials were concerned, there was sufficient in the world for our needs, or, alternatively, we had been able to secure the command of a sufficient quality to meet the full demands of our manufacturers.

CONTROL OF IMPORTS.

Speaking of the restriction of imports, Sir Albert said it was within the knowledge of all that the Government found in necessary during the war, either because there was insufficient tonnage, or for reasons of exchange, to impose severe restrictions upon a large proportion of the imports brought to this country. The time had come to considered the relaxation of these restrictions and it had been suggested by various interests that they should retain for a time their control. The reason advanced was that owing to the demands which the Government had made upon manufacturers, and to the enormous changes which had taken place, the Government should for a time keep a restraining hand upon the flow of imports until our manufacturers had had an opportunity to re-establish themselves on a peace footing. He thought that was a fair proposition, and one that should have the acceptance of the Government. At the same time they all desired to continue on the same closed and friendly relations with our Allies. Friendly rivalry there must be, but there was plenty of room in the world for everybody, and by close co-operation, good understanding, and a friendly spirit we should secure the peace of the world better than in any other way. As to the subject of excess profits, he was sure they would all sympathise with the task that would fall upon Mr. Austen Chamberlain, and he hoped some way would be found whereby the demands of the Treasury might be met without imposing any undue taxes upon the country's industries.

A MINISTRY OF COMMERCE.

As to the equipment of a new Ministry of Commerce, he believed this was about to be realised. The Board of Trade was a huge department. It has too many activities and responsibilities to do them all well. Some of them were going to be taken away and the Board of Trade would become a new department, to which leaders of our great industries might come and find a staff competent to deal with the questions brought forward. It would not be the function of this department to control or interfere with trade interests, but representatives of trade and commerce would be able to come to it with their problems for advice. He trusted that those who sought its advice would come representing the views of a whole industry and not a part of one, as often happened in the past. Into this new department they proposed to bring men from outside of wide experience, compentent to advise on trade matters.

THE PROBLEMS BEFORE US.

The problems before the country were not easy. We had got facing us competition more intense than any experienced in years past. We had facing us also the question of higher wages and better conditions of employments, and on top of that the enormous burden of debt arising out of the war. How were these problems to be met? Obviously there was but one answer, and that was by increased production and low costs of production. He thought it would be agreed that there was a willingness on part of employers to give the best possible wages and afford the best conditions of employment. He was satisfied himself that good wages and reasonable hours of employment were a good business proposition provided that in return the workmen gave a fair day's work.

It was very disturbing that at this time we should find such a spirit of unrest throughout the country. There appeared to be a feeling among working people and among some of their leaders that the only way of advancing their interests was by going on strike.

LABOUR UNREST.

"I cannot myself," said Sir Albert Stanley, "conceive anything more disturbing to the proper development of our trade and industries than to have these constant outbreaks. One is often asked why it so often happens that the settlement of a labour dispute only comes after a strike has taken place. Again, this may be one of the problems arising out of the war. I must confess there have been instances when it seems very difficult to find a reason why things are allowed to go to a final issue, and men are out before a settlement is reached. I am not pretending to judge the merits of any dispute; there may be reason in them, or otherwise. I am only suggesting that this method of securing the redress of any alleged grievance is not in the best interests of the men or of the trade country, and some way must be found sooner or later whereby these great questions affecting labour may be settled without resort to a strike."

Concluding, Sir Albert mentioned that one of the first matters to be dealt with in the new Parliament would be to stop "dumping" in this country, and said he could not understand why it had been allowed so many years.

INDUSTRIAL PROGRESS IN THE UNITED PROVINCE.

Government Resolution.

The following Resolution of the United Provinces Government on the Report of the Director of Industries, United Provinces, for 1917-18 is taken from the *United Provinces Gazette* of March 1, 1919:—

The position which has been reached in the development of the industries of the Province is in some respects similar to the position now confronting the Forest Department. During the last few years there have been difficulties arising out of shortage of transport and restricted imports of machinery but, on the whole, industries generally, have benefited considerably by war conditions which have assisted a policy of expansion. High prices and the demands of the Army department have applied an effective stimulus to production, but when the stimulus is removed, a special effort will be necessary to pervent decline. The position is fully realized by the leading industrialists of the province and every endeavour is being made to cope with the new situation. Mr. O'Malley's report indicates that while the industries of the province are still only in their infancy and many have yet to be established, sound foundations are being laid. The report also demonstrates that it is essential that, for some time to come, a considerable number oe European experts should be engaged for the training of indigenous labour of different grades. The demobilisation of the territorial regiments now in India offers an excellent opportunity for securing the services of skilled industrial artisans and teachers in that trades that are most promising and efforts are being made by the Local Government to utilise the occasion.

The present position generally may be illustrated by the leather industry. During the war large extensions have been carried out in the existing factories in Cawnpore and some new tanneries have been started. The Local Government has furnished help where necessary in securing suitable sites and in other ways. The Director points out that the leather industry in this province has immense possibilities before it, but, at the same time, he recognises that the developments which have taken place have been stimulated by the demands of the Army and he is doubtful whether, when conditions again become normal, the business will continue on its present scale. There is, it is true, a large supply

of hides and skins in the province, but we have no tanning agent of equal value to *cassia auriculata*, and the supply of *babul* bark is also limited specially in the neighbourhood of Cawnpore. The Local Government is fully sensible of the great advantages to be secured by an extensive cultivation of *cassia auriculata* and experiments have been conducted for several years past. It has not yet been proved that the plant can be grown with profit on a commercial basis in the soil of this province, but His Honour has directed a continuance of the trial on an extended scale.

The Local Government has also taken steps for the growing of *babul* trees on canal banks. The various minor tanning materials in the forests of the province are receiving attention. The Lieutenant-Governor will be ready to consider suitable proposals for the commercial utilisation of such products. One such factory is already at work in the Naini Tal district. Sir Harcourt Butler thinks that one solution of the existing shortage of tanning materials in Cawnpore many possibly be found in the establishment of factories in parts of the province whence it is too expensive at present to transport the raw material to Cawnpore. The Director of Industries has advocated the establishment of a tanning school. His Honour desires that the Board of Industries should make proposal for such a school, should the idea commend itself to them. Any considered scheme that may be submitted by the Board of Industries will receive the careful attention of the Local Government.

The war gave a very considerable impetus to the cotton and wool industries of the province which are at persent more or less concentrated in Cawnpore. The mill-owners took full advantage of the considerably increased demand. The Lieutenant-Governor hopes that the enhanced outturn of these mills will be maintained in peace times, to the great benefit of the consuming classes of the province as also of the workmen employed in these mills. The cotton industry has had to contend with very short crops during the last two years and prices have consequently been inflated.

With the return of normal agricultural conditions this difficulty will, it is hoped, disappear. There is only a limited supply of wool of a suitable quality in the province. Experiments in growing sheep of a better quality for the purposes of wool-production have been made in past years and the Local Government will be ready to consider any suitable proposals for further efforts in this direction. An industry which has come into prominence during the war is the manufacture of brush-ware. There is a fair supply of raw materials in the province and probably its quality can be improved by a sustained effort. His Honour hopes that this industry will receive the attention that it deserves.

Another industry which is being accepted by capitalists as affording one of the most promising fields for development is that of oil-pressing. This industry appears to have suffered more than it has gained by war conditions. Owing to import restrictions it has not been possible to purchase any modern oil-pressing plant from abroad and no new mills therefore have been established during the war. It is recognised that the methods used at present are wasteful and results from the inefficient machinery used are unsatisfactory. Capitalists are said to be waiting to put up modern oil mills as soon as conditions for the purchase of plant are favourable. The Director of Industries recommends the appointment of an oil expert to systematise the industry on modern lines. The Local Government will await the views of the Board of Industries. Linked up with the oil industry is the manufacture of varnishes, oil-paints and lubricants. Here, again, there is an ample field for development. It is noted in the report that factories for the manufacture of paints and varnishes have been established in other provinces. The Director of Industries will no doubt take steps for the encouragement of similar enterprise in this province.

The local manufacture of glass-ware has made rapid strides during the war, and a number of new glass-works have sprung up. Improvements have been introduced at the Allahabad glass-works which is the largest concern in the province, and useful glass-ware has been turned out there for military purposes. The work at Bijohi have been financed to a certain extent by Government which has enabled them to make good progress. Mr. Elland, the glass expert who was brought out from England by this Government at the commencement of the war, is about to return home on the termination of his engagement. His services have been of great value in the development that has taken place in the provincial industry. Endeavours are being made to obtain another expert from the territorial regiments. It is also understood that the Government of India contemplate the appointment of a specialist in glass with superior scientific qualifications whose services will be available for the whole of India. The shortage of skilled blowers in the province is rapidly disappearing as a consequence of the training imported at the different works. The Indian Munitions Board have very kindly helped in this direction by the loan of man from the territorial regiments to the Allahabad glass-works. The Director of Industries has appended to his report a statement showing the continued increase in the import of glass-ware during the last

three years—a remarkable fact when restrictions on imports and high prices are considered. The special attention of the factories has been drawn to the steady growth of imports in beds and false pearls which the poorer classes generally use for ornaments and jewellery. The bangle-making industry of Firozbad is doing well and the bangles turned out have greatly improved, but the output is quite sufficient to meet the demand and the import of Japanese bangles has steadily increased.

Difficulties of procuring plant have naturally prevented the establishment of new industries upon a large scale and the shortage of railway wagons and coal has also hindered progress. There is little to notice in consequence as regards metal-ware. The metal-pressing plant that was imported by the Local Government has been lent to a private firm. Endeavours are being made to secure the services of die-sinker for the province. The position of the match industry is also disappointing. The prices of chemicals still continue to be prohibitive. The management of the Bareilly factory, however, hope to recommence operations very shortly. The Local Government will be willing to consider any reasonable applications for facilities with regard to suitable timber for manufacturing purposes.

The Industrial Chemist, Mr. Srivatsava, has compiled a detailed report of the various activities of the Technical Laboratory attached to the office of the Director of Industries and though there is naturally much in it which only appeals to the expert, it is by no means devoid of interest for the layman. Experimental work as regards dyes and chemicals required in the dyeing, tanning and other industries has met with a considerable amount of success. The work has been of value to several industries dependent on a supply of chemicals which were formerly imported.

The laboratory has also been engaged for the last two years on experiments regarding the manufacture of essential oils and valuable data have been obtained commercial possibilities have not yet been worked out, but it may be noted that a new firm have started a factory in Cawnpore with an up-to-date plant for the manufacture of essential oils and allied products. In pursuance of a recommendation of the Board of Industries, the Local Government is placing the Director in funds for sustained experiments on a comparatively large scale with the oils and perfumes that are now manufactured in the province or for which an adequate supply of raw materials is locally available.

The Government Experimental Soda Factory at Cawnpore, which was also under the charge of Mr. Srivatsava, was started with a view to manufacture sodium carbonate and caustic soda from reh. The experiment was novel and was conducted with much ingenuity and resource. Local capitalists have readily availed themselves of the methods demonstrated at the Government factory and as private factories are now springing into existence, a long lease of the Government factory is being given to a private firm.

Mr. O'Malley's report does not embrace the industries that are closely allied with the operations of the two departments of Agriculture and Forests, for example, the manufacture of sugar or of timber products. There has been much activity in some branches of these industries and the Lieutenant-Governor has already expressed his views with regard to the development of these industries in the recent views of the report of the Director of Agriculture and the Chief Conservator of Forests. The smaller art industries of the province have naturally suffered during a period of high prices and restrictions on exports. They are, however, receiving attention and it is hoped that with normal conditions many of them will again attain prosperity. The Emporium at Cawnpore, which was established with Government assistance with the object of bringing the actual producer in touch with the consumer, has had various difficulties to contend with and proposals are now under consideration for its re-organization on new lines. A special enquiry has been made into the position and prospects of the gold thread industry of Benares and the Local Government has recently sanctioned a grant for the improvement of this industry. The School of Arts and Crafts in Lucknow, which hitherto had been considered in the nature of an experiment, has now been made a permanent institution. The Lieutenant-Governor hopes that it will turn out pupils who will combine business aptitude with improved design and execution and will thus be the means of giving new life to the numerous art industries of the province. High prices of mill-made cloth and the restriction of imports from Lancashire might have provided a good opportunity for the revival of hand-loom weaving in the province, but for the limited supply of yarn which was a result of the short cotton crops in the country. The Central Weaving Institute at Benares is now rapidly getting into touch with the weaving community in different parts of the province, partly through the agency of the stores attached to it for the sale of yarn and partly through the peripatetic weaving schools. A new departure which Sir Harcourt Butler welcomes has been the experimental manufacture of various accessories for weaving which used to be formerly imported. His Honour hopes that efforts in this direction will be

persevered with. The smaller weaving schools have had varied success and evidently much depends on the interest taken by local workers. The Lieutenant-Governor thinks that in addition to the instruction given in the schools it is essential that the weavers should be assisted with advances for the purchase of looms and accessories and, if possible, co-operative orgauizations should step in for the purchase of raw materials and the sale of the produce of the looms. There has been some extension in the number of hosiery and blanket-weaving classes although the former have been handicapped by the difficulties experienced in obtaining knitting machines and needles. The hosiery industry has a vast field before it and His Honour is glad to observe that it is gradually establishing itself as a home industry among the lower middle classes of the province.

With regard to the extension of industrial and technical education the year has been one more of preparation than of actual achievement. The existing institutions have made considerable progress. A reference has already been made to the Central Weaving Institute and the smaller weaving and hosiery schools. The School of Arts and Crafts has been re-organized and made permanent. The School of Needle-work at Lucknow has also been placed on improved lines and it is hoped will meet a distinct want. The Central Wood Working Institute at Bareilly has since the close of the year been transferred to the control of the Forest Department in order that in addition to its educational work it may also be utilised for the purposes of testing the use of the various miscellaneous products of the forests of the province on a semi-commercial scale. The Lieutenant-Governor believes that there is great scope for the organization of a large industry in future and cabinet-making throughout the province and he has since the close of the year sanctioned the establishment on an experimental basis of a carpentry school at Allahabad. He hopes that it will soon develop into a useful institution. The technical schools at Gorakhpur and Lucknow have had a successful year under Messrs. Swinchatt and Lyons. His Honour is specially gratified to observe that the passed pupils of these two schools have no difficulty in obtaining suitable employment. A scheme for the establishment of another technical school at Jhansi has also been sanctioned and His Honour trusts that with the co-operation which has been generously promised by the G. I. P. Railway the school will soon start work and prove a distinct success. In Cawnpore, both the school of dyeing and the school for leather workers have attracted a good class of pupils and are providing useful instruction. The Local Government has also determined to establish in the very near future a school in Cawnpore for workers in the textile mills and a school for electric wiremen. For the location of the various industrial schools at Cawnpore, a suitable site is being acquired. In this connection the Lieutenant-Governor wishes to acknowledge the cordial co-operation that the Local Government has received from the Upper India Chamber of Commerce in devising schemes for the industrial education of the working population of Cawnpore.

His Honour hopes to see during his term of office a considerable expansion of vocational instruction in the province. He is glad to observe that the lines on which the provincial programme of industrial and technical education is based are in harmony with the recommendations made by the Industrial Commission in this respect. War conditions stood in the way of a start being made with the proposed Technological Institute at Cawnpore. Sir Harcourt Butler is anxious that work in the Institute should begin as soon as possible and he is already taking steps for the appointment of a competent Principal in order that a beginning may be made at once.

In the matter of industrial development and technical education the Lieutenant-Governor is anxious that the activities of the State should receive full co-operation and constant advice from the commercial and industrial communities of the province. With this view the Board of Industries has been re-organized and divided for detailed work into two sections. His Honour is gratified to note that the re-constituted Board has already displayed considerable initiative and is taking a keen interest in the economical progress of the province.

Sir Harcourt Butler is indebted to the Board of Industries for much valuable assistance.

Mr. O'Malley has officiated as Director of Industries since the deputation of Mr. A. H. Silver, C.I.E., to the Indian Munitions Board in June, 1917. The War has thrown on the Director of Industries a great deal of additional work which has, to a certain extent, hampered his ordinary duties. Sir Harcourt Butler desires to acknowledge the tact and industry which Mr. O'Malley has displayed in his work and wishes to thank him for a full report.

His Honour hopes that the report will be submitted more punctually in future, as in industrial and commercial matters specially it is important that the results of the year's work should be reviewed without any unnecessary delay.

LABOUR SUPPLY IN THE MALNAD.

The following Mysore Government Order No. G. 20308-13—San. 80-16-15, dated 10th March 1919 has been issued :—

Since the introduction of the Malnad Improvement Scheme which had the effect of setting the people in that area to think about the amelioration of their condition, the question of the supply of labour to the areca-nut garden owners has been frequently urged for the consideration of Government. Much valuable thought has been bestowed on the subject, both by individual members of the Malnad Improv. ment Committees and by the Committees themselves as the result of which several scheme have been submitted for the consideration of Government, with a view to secure Government assistance and co-operation, while not taking state finance to any great extent. Government appreciate the earnestness with which the details of a scheme of this kind have been threshed out. After having carefully considered the subject in its several aspects, they desire to point out that the question of labour supply is essentially a social and economic problem, the success or failure of which depends upon the amount of co-operation there is among the land-owners themselves, and their capacity to organize for a common purpose on definite principles. This question affecting, as it does, the interests of both employers as well as labourers, besides being intimately connected with the question of wages and the conditions of employment is, however, pre-eminently one for private initiative assisted, if and when necessary, by Government in matters, relating to superintendence and advice.

2. It has been repeatedly urged, however, that in the present state of the malnad, initiative in a matter of this kind cannot be expected and that in order to infuse confidence into the minds of both the employer and the cooly, and to check the evil influences of the uncontrolled Kangani, the interference of Government in the earlier stages of the scheme is necessary. Government agree that there is need for an organization of this kind and that a start may be made to induce the garden owners to combine for the economic development of their gardens, which form a valuable asset of the State. Government are accordingly pleased to direct that an experiment be made in this direction in respect of the taluks of Koppa and Tirthahally in the manner and subject to the conditions set forth hereunder.

3. Before the establishment of a Labour Bureau on the lines recommended the Shimoga District Committee, the Chairman of the Committee is requested to make a preliminary investigation into the following matters and to submit a report to Government within three months.

(1) Whether three-fourths of the number of labour employing garden owners in the taluks, referred to, agree, in writing, to act through this department only, becoming members thereof, and subject to such rules and conditions as may be prescribed by the department in respect of wages, manner of employment, hours of labour, etc.

(2) Whether the land-owners will be prepared to contribute a moiety of the cost of the scheme, by raising a suitable acreage cess.

Whether the employers of labour will provide for adequate sanitary arrangements for housing the labourers, etc.

4. On these conditions being satisfied, a labour recruiting agency will be stationed at Udipi as recommended by the Shimoga District Committee establishment for dealing with the following matters :—

1 Labour correspondent Rs. 200 plus local allowance Rs. 50 plus fixed travelling allowance Rs. 50 ...	300
1 Clerk	40
1 Clerk	15
1 Peon	8
3 Labour agents on Rs. 35 each with fixed travelling allowance of Rs. 10 each...	135
Contingencies	50
Total per mensem ...	548
Cost per annum ...	6,776

N.B.—Maistries to be entertained on a monthly pay not exceeding Rs. 10 a month to be supplemented by payment of commission at 2 or 3 per cent on the amount paid to the coolies supplied to each owner.

(1) Obtain information as to where, when, what kind of labour and to what extent labour will be available within any specified labour supplying area.

(2) Ascertain the extent to which and the period during which labour will be required in the taluks taken up for consideration.

(3) Arrange for the preparation of a list of reliable Kanganies or cooly maistries.

(4) Suggest arrangements for regulating the payments to be made by employers either in the shape of wages or in the shape of advances.

(5) Supervise cooly interests and prevent desertion.

(6) Undertake as for as possible, the steady supply of labour at short notice. The attention of the District Committee is *invited to the fact that the weak point of* the whole problem seems to lie in the fact that the recruiting Kangani is ordinarly an irresponsible person who tries to fleece the cooly and to exploit the employer, and the chief effort of the scheme should therefore be to minimise the Kanganis' evil influence, by proper control. The appointment of paid maistries will, it is hoped, secure the above object and if a liberal commission is arranged to be paid to the maistry on the results of his work, the danger of his *falling into a state of paid inactivity may* be avoided.

5. The Labour Agency will be under the control of the Shimoga District Committee, assisted by an Advisory Board of ten members elected from among the land-owners, who are members of the department.

6. The scheme will be temporary for a period of two years and a moiety of the total cost in each will be met out of the Supari Cess Fund, the other half being contributed by the labour employing landowners, calculated on the basis of the acreage under each member's holding.

7. The Chairman, Malnad Improvement Committee, Shimoga, is also requested to submit draft rules for the working of the Bureau, together with the accounts, reports and forms that may be prescribed for the Bureau, for the approval and order of Government.

TOPICS FROM ECONOMIC PERIODICALS.

THE COCONUT INDUSTRIES.

We take the following from the *Board of Trade Journal*:—

The coconut estates of Trinidad, confined within comparatively small portions of the island by the sea coast, are yielding greater profits on the capital invested in them than any other agricultural industry in the island. With constant planting of new trees, the industry, it is considered, is bound to expand in importance during the next few years.

During the year 1917, the export of coconuts from Trinidad amounted to 16,595, 282 coconuts locally grown, and also 760,430 foreign coconuts, chiefly Venezuelan. Most of these were shipped to the United States, the figures being 13,867,655 coconuts valued at 398,912 dols., and 696,100 Venezuelan coconuts, valued at 22,806 dols.

The export of copra in 1917, according to the United States "Commerce Reports," amounted to 7,201,448 lb., of which 3,277,258 lb. were exported to the United States. All the copra exported from Trinidad during that year was produced locally.

Production of Coconut Oil.

Trinidad produces approximately 140,000 gallons of coconut oil a year for the consumption of the local population, especially the East Indian coolie classes, who use it both as a food and as a lotion for their bodies. The amount of coconut oil produced depends to some extent on the relative price of copra, for when the export price of copra offers more profit than the manufacture of the same into coconut oil, the owners prefer to sell copra for export. Large exports of copra, which would seriously curtail coconut oil production, would never be permitted, as the local government would impose embargoes to keep, sufficient copra in the country. It was to prevent the threatened curtailment in the output of coconut oil, as well as to increase the Revenue, that the export duties on nuts and copra were increased in May 1917.

Productive Localities in Trinidad.

Coconut trees are to be found practically all round the coast, but the production is concentrated chiefly in two districts—one, the Cedros district, has about 9,640 acres, 7,000 of which are bearing, and the other, the Mayaro district, has 7,500 acres in trees, all bearing coconuts. The island of Trinidad altogether has about 27,000 acres in coconuts,

one-third of which is probably not yet bearing. The island of Tobago has now about 9,000 acres, but only a very small proportion of trees are bearing.

There are about 21,000,000 coconuts produced annually in the Cedros district, of which approximately 16,000,000 are grown on large estates owned by English companies or planters of French and English extraction, and about 5,000,000 on small estates owned chiefly by East Indians and negroes. The cost of working these small estates is considerably more per acre than that of large estates. Large estates vary from 800 to 1,600 acres, and small estates from 10 to 100 acres.

Next in importance to the Cedros district is that of Mayaro, which covers about seventeen miles of the southern part of the east coast of Trinidad, with an extent inland of about a quarter of a mile. Some 12,000,000 coconuts are produced annually in this district, but the nuts are smaller than those produced in the Cedros district. The soil conditions are less favourable, and only about 20 per cent of all the coconuts produced are within the two classes desired for important into the United States as nuts. The remaining 80 per cent is used for copra and coconut oil, the shells serving as fuel for the manufacture.

Oil Factories in Mayaro.

In the Mayaro district there are three factories, each of which makes use of 7,000 coconuts per day for the manufacture of oil. The total output amounts to about 100,000 gallons per year, and about 500,000 lb. of coconut cake, sold mostly in Trinidad for feeding stock. Probably about one-half of all the coconuts produced in this district find their way into these three factories for making oil, but this depends on the relative price of copra.

Machinery in Use—Camels' Hair Bagging.

At one of the coconut oil factories the machinery used consists of two shredding machines, one of Scotch and one of German manufacture, which grind the copra by tearing and cutting it into small pieces; several edge-runner mills which grind without concussion, thus preventing premature expression of oil; three presses of German manufacture, having 3 tons pressure to the square inch; and German hydraulic pumps. The press cylinders are made of cost steel and have pistons which press up against the pans holding the copra.

The greatest difficulty at present in connection with extraction of coconut oil is that of obtaining camels' hair press bags. Before the war these were imported from Germany at a cost of 10d. per lb. They are now imported from New York, but cost 4s. 2d. per lb., and are said to last only one-sixth the time of those formerly used. A bale of this bagging now lasts only about four months, it is said, and is difficult to import at all, but the German bagging of equivalent measure imported before the war would last about two years.

An analysis of coconut products was made at a factory in Port of Spain, the nuts having been delivered whole to the factory for this purpose, although usually only copra is brought there. This analysis revealed that 1,000 selected nuts, weighing 1491 lb. in the shell, yielded 735 lb. of green copra, 446 lb. of shell, and 310 lb. of water; the green copra yielded 440 lb. of dry copra. The same number of culls, weighing 1,043 lb. in the shell, yielded 326 lb. of shell, 189 lb. of water, and 528 lb. of green copra, or 318 lb. of dry copra. The 2,000 coconuts yielded 45 gallons (imperial) of coconut oil, averaging 6 gallons per 100 lb. of copra, and 290 lb. of coconut meal. The factory ordinarily uses 20,000 lb. of copra every week, making 1,200 gallons of oil and 10,000 lb. of meal. Besides coconut shells, wood and coal, a good deal of saw-dust obtained from a saw-mill in the vicinity has been used for fuel.

Coir Fibre.

In addition to copra and coconut oil, the coir fibre of the coconuts is also a source of revenue in connection with the coconut industry of Trinidad, notwithstanding the fact that a vast amount of this fibre is wasted on husks thrown away or used only for fuel. At the gaol in Port of Spain, prisoners have an industry of making mats from coconut fibre, these being used for household purposes, for motor cars, etc. In Port of Spain there is also the West Indian fibre factory, employing about 50 persons, including 16 machine men, with an average output of between 6 and 7 tons of fibre per week.

At this factory the crude material of coconut husk is purchased locally, and the fibre finds a reads market in Europe, Venezuela, British Guiana, and other places. Sixteen machines standing in regular alignment perform the task of extracting the fibre, the motive power being supplied by an 85 horse power semi-Diesel two-cylinder engine imported from Manchester.

In addition to the coir-fibre factory at Port of Spain already mentioned, there is another plant existing for such purpose on the Cedros Peninsula, which, with four machines, can use the fibre from about 2,000 coconut husks per day. It is temporarily closed on account of the difficulty of shipping the fibre.

There is the utmost feeling of confidence in Trinidad in the future of the coconut industry, and it is believed that there will always be an active world-demand for coconut products, especially Copra in connection with the increasing use of

margarine. Many of the sugar planters in Trinidad, who fear that present very high prices, will not continue, are planting coconuts as a safeguard of future prosperity. Many coco planters also, when they have suitable land, are planting coconuts, as it is believed that there is more prospect of stability in view of the coco market being more limited and of the great increasing competition from the new coco lands of Nigeria.

TREATMENT OF COTTON SEED FOR COMMERCIAL PURPOSES.

The full text of the paper on "The removal of the residual fibres from cotton seed and their value for non-textile purposes" by Mr. Ed. C. de Segundo, A. M. Inst. C. E., Inst. Mech. E., M. I. E. E., read before the Royal Society of Arts, with the discussion that followed, is published in the Society's *Journal* of 14th February, 1919. A considerable part of the paper deals with the potential value of the Indian cotton seed crop. The following are extracts from the paper :—

The quantity of short cotton fibre left upon Indian cotton seed after ginning seems to vary considerably. One authority puts it at from 8 per cent to 12 per cent of the total weight of the ginned seed. Another estimates it at about 3½ per cent. The only Indian seed used hitherto in the crushing industry in Great Britain is known in British markets as "Bombay" seed, which does not retain more than 2 per cent of short lint calculated on the total weight of the seed.

During the past few years the cultivation in India of the American variety of cotton has been considerably extended. According to the Indian Government returns, about 400,000 bales (of 500 pounds) of Cambodia seed were grown in 1917 corresponding to the preduction of about 250,000 to 270,000 tons of seed. Cambodia seed resembles the American Upland closely, and the seed may therefore be taken to retain after ginning from 10 per cent to 12 per cent of its total weight of short lint.

In the spring of 1917, Sir A. D. Steel-Maitland (then Under-Secretary of State for the Colonies) delivered an address at the London School of Economics and Political Science on "Oils and Fats in the British Empire," in the course of which he stated that "the local production of cotton seed in India is very large, reaching 2,000,000 tons per annum. The quantity exported, chiefly to the United Kingdom, varies from 100,000 to 400,000 tons, a slight difference in price in being sufficient to bring forward largely increased quantities."

This estimate is corroborated by Professor Dunstan, who put the Indian cotton-seed crop in 1913-14 at 2,120,000 tons (*Bulletin* of the Imperial Institute, July-September, 1917.)

So far as any systematic utilization of the Indian cotton-seed crop is concerned, the persent situation is well summed up in an interesting and instructive paper read before the Manchester section of the Society of Chemical Industry in May, 1917, by Mr. Kapilram H. Vakil, chief consulting chemist to Messrs. Tata Sons, Limited, of Bombay. He says; "The total area under cotton in India has been of late nearly 23,000,000 acres, and the total estimated output of cotton from this acreage is 4,500,000 bales of 400 lb, each, or about 800,000 tons of cotton. From these figures the quantity of seeds produced during the year may be roughly calculated on the basis of 30 per cent lint and 70 per cent seeds which amounts to 1,870,000 tons. The amount of seed required for agricultural purposes would be at the rate of 14 lb. per acre, about 100,000 tons, leaving about 1,750,000 tons for feeding cattle and for crashing. In 1901, when Indian seeds were first introduced into England, there were then produced in India 1,260,000 tons of seed. This hugs quantity of seed was practically wasted."

Now, Mr. Vakil presumably used the word "wasted" in the sense of "not turned to account in a manner representative of proved commercial possibilities." In this sense Mr. Vakil is right. Even to-day, owing to the fact that the cotton-seed oil industry in India has not been developed on modern lines to any appreciable extent, large quantities of cotton seed have been fed direct to cattle in India, which, undoubtedly, is about as "wasteful" a proceeding, from the point of view of national economics, as could be imagined.

In a Consular report issued by the United States Government (Department of Commerce) on November 4th, 1918, the following reference is made to cotton-seed crushing in India :—

> "India is in the same condition as was the United States forty years ago as regards the scientific utilization of cotton-seed. Except for some 250,000 tons exported to England, and for the quantity needed for sowing, the cotton seed is practically all used for

fodder, at an enormous economic waste of edible oil. There was but one oil-mill in India in 1915. The annual loss due to lack of a modern crushing industry in India has been estimated at Rs. 315,000,000."

This estimate seems to me to be rather a high one. Possibly it is based upon present-day prices for cotton-seed oil and cake, which, of course, cannot be expected to maintain their present level. I have gone carefully into the matter and, assuming that only 1,500,000 tons of seed per annum are potentially available in India for crushing, and that the residual fibres on such quantity are properly turned to account, the average Indian cotton-seed crop should have a market value, under pre-war trading conditions, of certainly not less than 18 to 19 crores rupees (£12,000,000 to say, £12,500,000). After deduction of the costs and expenses of treatment (about 2 crores) this works out to a return of about 106 rupees (about £7) per ton of seed. So far as I have been able to gather, the average price of cotton-seed up country in pre-war times did not exceed 45 rupees (about £5) per ton. Hence, the *nett* loss in revenue owing to the absence of a fully developed crushing industry may be put at £4 per ton of seed, or £6,000,000 per annum as a minimum figure. Doubtless, were 1,500,000 tons of cotton-seed milled scientifically in India, and the products dealt with in the light of modern knowledge and experience, the *actual* nett loss in revenue would prove to be much higher than £6,000,000 per annum.

Let us now examine into the advantage to be gained by defibrating Indian seed destined for export. We will consider two varieties, Bombay seed and Cambodia seed, which may, respectively, be taken to be representative of the least woolly and the most woolly of the Indian varieties. Bombay seed retains only about 1½ per cent of merchantable fibre worth recovering; but measurements show that after the removal of this quantity of fibre the seed bulks appreciably more closely, that is to say, a given volume will contain from 12½ per cent to 15 per cent more defibrated seed than undefibrated. Assuming that the defibration were carried out at the ginnery—as, of course, it ought to be—and that 5 per cent of dirt and other foreign matter is also removed in the process of defibration, a railway truck of cleaned defibrated seed would carry about 15 per cent more seed, and some advantage in freight charges would be obtainable on this account. The shipment sack now used would contain some 15 per cent more seed, and as freight is paid per ton measurement—but the seed is sold in British markets per ton weight—the shipper would save some 3s. in the £ in ocean freight, and also something on the sacks. Produce brokers who have inspected samples of Bombay seed, cleaned and defibrated by this seed-defibrating machine, have stated that such seed would command a premium of 15*s.* per ton in British markets above prices ruling (in pre-war days) for Bombay seed as now shipped. Under conditions ruling to-day the premium would be much higher.

Cambodia seed may fairly be assumed to be on a par with American Upland, and may thus be taken to retain, say, 11 per cent of its total weight of short lint after ginning.

This seed would probably contain the same amount of dirt and foreign matter as Bombay seed, say 5 per cent. Possibly 2 per cent of its weight in "linters" would be recoverable by saw-linting machinery, and a further 7 per cent of "seed-lint" in the seed-defibrating machine. This wood leave about 2 per cent of its weight of very short lint on the seed shipped, which is about the quantity found upon Egyptian (a bald) seed, and is useful in binding together the cake made and preventing it form becoming friable.

Measurements made of Uganda seed (which is similar to Cambodia) before and after defibration show that a given volume will contain about 20 per cent more weight of defibrated seed, and London cotton-seed brokers who have inspected samples of this seed after defibration state that it would command a price within, say, 5*s.* or 10*s.* of Egyptian seed, provided, of course, that there was an equivalent in oil. From analyses which have been furnished to me by Messrs. Cloyton, Beadle and Stevene, it would appear that the percentage of oil in cleaned defibrated Ugaoda seed should be well up to that in Egyptian seed. The average difference in price between Uganda and Egyptian in pre-war times may be taken on the average to have been about £2, so that cleaned defibrated Uganda seed should command a premium of about 30*s.* per ton over the price of such seed as shipped heretofore.

The table below indicates the additional return which should be obtained by defibrating these two varieties of Indian seed, *viz*, Bombay and Cambodia, prior to shipment from India to British ports. As a measure of prudence, the premium on defibrated Bombay seed is taken at 12*s.*, and that on defibrated Uganda (or similar seed, such as Cambodia) at 25*s.* per ton,

	Bombay seed 100 tons (say 2 per cent residual fibre)		Cambodia seed 100 tons (say 11 per cent residual fibre)	
	per cent	tons	per cent	tons
Dirt	5	5	5	5
Linters	...	...	2	2
Seed-lint	1½	1½	7	7
		6½		14
Weight shipped		93½		86
		100		100
Premium on defibrated seed in British markets	Say 12*s*.		Say 25*s*.	
Value as now shippen (undefibrated)	£5 per ton		£7 per ton	
Value realised for quantity shipped	£5 12*s*. per ton	£ 523	£8 5*s*. per ton	£ 709
Add net profits on sale of linters		...		25
Add net profit on sale of seed-lint		11		49
Add saving on freight owing to closer bulking (taken at 12½ per cent for Bombay and 20 per cent for Uganda), and saving of £1 per ton of dirt and seed-lint.		Say 19		Say 34
Total ...		£553		£817
Value of seed as now shipped	£5 per ton	500		700
Net additional return		53		117
Net additional return per ton original weight of seed (100 tons).	10*s*. 6*d*.		£1 3*s*.	

(NOTE.—Figures throughout refer pre-war to trading conditions.)

If the percentage of dirt in the seed should be less than that assumed (5 per cent of the total weight of the seed) the additional return per ton original weight of seed would be increased. It will, of course, be understood that the figures above are *exempli gratia*. In practic, the additional return may prove larger or smaller according to circumstances, but in any case it should be substantial.

These figures, it is perhaps needless to point out, must not be taken to indicate that a given quantity of seed could be made to produce propotionate results anywhere in India. No doubt in some localities cotton seed will continue to be fed direct to cattle because local conditions may militate against its being dealt with profitably in any other manner, just as in the United States probably 5 per cent, or more, of the cotton-seed crop is unavoidably "wasted" for similar reasons.

DISCUSSION.

An interesting discussion followed the reading of the paper in which Mr. D. T. Chadwick, I.C.S., Indian Trade Commissioner, Mr. C. F. Cross, F.R.S., Professor John A. Tod, Mr. J. W. Pearson, (Chairman of the British Oil and Cake Mills), Dr. W. Lawrence Balls and others took part. Mr. Chadwick said that Mr. de Segundo's paper dealt with a

process which should be of the greatest interest to India. He would not follow the author into his estimates of what were the possible total outturns of cotton-seed cake and oil in India. Whole cotton seed was the Indian farmers' favourite concentrated food for their cattle, and it would need much effort to persuade them to use cake instead. Yet, in spite of that, cotton seed was crushed for oil in India, and when priecs were favourable it was also exported in considerable quantities. The author was right in saying that the presence of these short fibres on the seed was looked upon with disfavour by the export trade; not only were they a waste article, but a deleterious one owing to their causing the seed to heat in transit. The only suggestions hitherto made in India for dealing with them was to destroy them either by abrasion or by burning. Mr. de Segundo now proposed to remove them in such a way as to give them a real market value. These fibres also, when removed, could be pressed and baled. The importance of the proposed process to India's export trade was obvious, but it did not stop there. It had a direct bearing on Indian industries. Unless the prices offered for such short fibres by the artificial silk industries were so high as to tempt them to be exported, they should find a ready market among the paper-mills of India which are in need of a local supply of raw material giving readily add easily a good white paper. Another reason why the process should interest India was that undoubtedly the correct position for these machines was alongside the gins employed in removing the spinnable lint from the seed-cotton. The ideal undoubtedly was for the need, after leaving the gins, to be conveyed, preferably automatically, to a series of these machines, which would then remove these smaller fibres so that they could baled separately and sent to the paper-mills or other factories. The seed bulking more costly than before would go to the farmer or to the oil-mill. He wished Mr. de Segundo had seen his way to give some indications of the outturn of lint per hour and the horse-power used, The process apparently possesed great possibilities of commercial success, and was one eminently suited for Indian conditions. It was a most interesting and stimulating paper. He would only add that Mr. de Segundo had mentioned two machines, one for removing the short fibres from the seed, and one for removing the short ficres from the cotton hulls produced by decorticating the seed. It was the first of these, which had been shown at work that afternoon, that, in his opinion, was the one of the most immediate interest to India. With the development of the cotton-seed crushing industry in India, the second machine, which dealt with the decorticated hulls, should come into operation, as Mr. de Segundo had given good reosons for the view that in a country in which wooly cotton seed is produced, the decorticating system possessed advantages over that of crushing the seed whole.

ECONOMIC NOTES.

OPEN-AIR SCHOOLS.

The Hon'ble Babu Gopabandhu Das spoke as follows on the resolution moved by him at the meeting of the Bihar and Orissa Legislative Council held on the 22nd February:—

"Your Honour,

"The resolution which I beg to move runs as follows:—

"That this Council recommends to the Lieutenant-Governor in Council that in primary and secondary schools of this Province open-air conditions of living and teachining be, as far as practicable, encouraged and that costly huildings of a type as a condition for the recognition of the school be dipensed with where the school can be run on open-air lines with advantage.

"The resolution proposes nothing new. It simply recommends the use of that old universal thing, the first condition of life—I mean the pure air, the virtue of which is little recognized perhaps owing to its abundance in nature. It only emphasizes what medical men are always preaching as the primary requisite for a healthy existence.

"Nor do I ask for a novel experiment; for, your Honour knows that an open-air school is not a mere idea with me. It is not a picture drawn by imagination from the accounts of Asramas and institutions of ancient India. To me it is a fact, an actual thing which I have made, tried, and found sufficiently to stand the test. I would not have ventured to press the Government for its adoption as a system, were I not myself convinced of its usefulness and suitability to the purpose for which it is intended.

"The subject of my resolution is in the first place educational and as such it may fairly admit of an academic treatment for which I am afraid the present is not an appropriate occasion. But at any rate I wish to make it clear at the outset that I claim no originality in the experiment of the open-air system in the education of our youths. The Indian educational system of by-gone days offers a precedent for this and the open-air method has long survived the many changes that have come over the country and has still been lingering in our village *patshalas* and *Tols* though it has now been almost supplanted by close costly buildings. I remember how in my childhood I received my lessons in the village *patshala* under the spreading banyan tree which could give accommodation to children of all

castes, high and low, each occupying his seat sepa rately. In the sacred shade of that historic tree the distinction of caste among the children did almost vanish, a fact, which contributed in no small measure to degree of literacy in Orissa.

"I believe, Sir, most of the members of this Council are aware that the Victoria Satyabadi School, with which I am associated from its inception, is run on open-air lines. It has passed the stage of experiment and during the last ten years of its existance its open-air character has given satisfaction not only to the students and teachers but has also impressed those who have favoured the institution with their kind visits. From the result obtained at Satyabadi I feel myself justified in commending the open-air living and teaching for general acceptance.

"I think, Sir, I have not brought this resolution before the Council too early. The time has come when open-air methods should be introduced in our schools where and when it can be conveniently and advantageously followed. Influenza, tuberculosis and many other infections and epidemics are causing terrible havoc in the country, and medical opinion is unanimous that the use of the open-air is a chief remedy for these diseases. Our boys should learn to value the fresh pure air properly and when its importance is brought home to them they will be our chief agents in making the people appreciate its efficacy.

"There is also another consideration which is not less important—I mean the cost of education. In the meeting of the Select Committee on the Compulsory Primary Education Bill there arose the question of expenditure on education which necessarily involved the subject of school buildings. It cannot be denied that the importance attached to School-houses in our present system entails an expenditure which is by no means insignificant. If the country is to be studied with primary schools, as it must be before primary education is made effectively free and compulsory, enormous expenditure has to be incurred on account of buildings unless there is a change in the existing method and ideas. Everybody who has experience in organizing a school knows very well that the initial chief difficulty is building. Complaint is often heard that inspecting officers look more to the building and furniture than to the actual teaching as if bricks and wood possess all the virtues necessary to make education efficient and effective. Who does not know that for some defects in the school house grants are often suspended, and some times schools are reduced in status and occasionally threatened with abolition.

"That more money is spent on building than is necessary has often been a matter of public complaint. In a country with the traditions of forest universities such a complaint cannot be said to have no meaning. The large rather the lavish, expenditure on school buildings has produced an undesirable impression on the minds of the people which is responsible for the suggestion often made in several quarters that much of the increased educational allotments is deliberately wasted on houses and furniture in the name of efficiency, with the result that the expansion of education has been extremely slow and does not satisfy the growing demand of the country for a wider diffusion of knowledge. In these circumstances, I respectfully submit that it would be not a day too soon to take steps to minimize the cost of buildings.

"From the reply given by Government to a question of mine on the subject it appears that a type plan for middle schools costs Rs. 6,500 and the cost of construction of buildings for the Government high English schools varies from Rs. 1,06,000 to Rs. 1,42,000. These are astounding figures, of course, for a country whose poverty and ignorance make it imperative that its education should be as cheap as possible. It may be said that for private schools such heavy sums may not be necessary but Government schools are the models and departmental authorities will generally demand that private institutions should follow this model. It was to meet this demand that we had to spend a large sum of money on the buildings of the Satyabadi School unnecessarily and quite against our will. Though we followed the open-air system from the very beginning we could not advocate its cause successfully without having a building; for, we would then be misunderstood as trying to make a virtue of a necessity. Many distinguished officers of the department visited the school and seemed to have been favourably impressed with its open-air conditions, but none of them suggested any change in the school buildings which would reduce the cost of construction until Dr. A. Lancaster M. D. London on special duty for Tuberculosis Inquiry, Indian Research Fund Association, expressed his regret at our buildings being so out of harmony with the general open-air life. He writes:—

"In connection with my work, I am naturally interested to a special degree in all attempts to familiarize the people with the work under open-air conditions and it was delight to see how thoroughly the school was being run on simple open-air lines without any sacrifice of real efficiency.

"It was difficult to avoid some feeling of regret that the new buildings necessitated by the recent affiliation of the school to the university should be

of a character so different from the remainder of the school. One would have thought that these buildings also might have been of a simpler character affording necessary protection under more completely open-air conditions.'

"The opinion of so eminent an authority gave us no small support and now we found ourselves in a position to continue our open-air work with some security and confidence. I may however be permitted here to take this opportunity to thank the Hon'ble Mr. J. G. Jennings, C.I.E., who visited the Satyabadi School in his capacity as Director of Public Instruction for his sincere and sympathetic appreciation of our work on open-air conditions and it is no small satisfaction to me that since his visit to the Satyabadi School, he has got a plan prepared for primary schools on open-air lines and forwarded copies thereof by his circular letter of the 27th May 1918, to all Chairmen of District Boards of the Province. But it is a pity that the matter did not proceed further and it did not receive the consideration of the local authorities to which it was undoubtedly entitled. It need hardly be said that the step taken by the Director of Public Instruction amounts to a practical acceptance of the system I propose. As a matter of fact the Hon'ble Mr. J. G. Jennings called his plan the plan of 'the open-air primary schools.' My resolution asks for a wider application of this plan and proposes to make the secondary schools run on open-air lines. In this I am supported by another educational officer of thought and independence of judgment. Mr. R. McCombe, M.A., Inspector of Schools, Orissa Division in his inspection note on the Satyabadi School.

"However, a valuable lesson has been learnt from the experiment here made. It is clear that a High School in India can be sufficiently conducted through the greater part of the year in the open-air provided it possesses a piece of land shaded by plenty of trees. And it appears that for use in the rains a building of the simplest description, consisting mainly of roof and partition wall is all that is required.

"From the experience I have been able to gather by practical working and the suggestions received from the action and opinion of high educational and medical authorities, I think, I am now in a position to lay out a scheme for the formation of open-air classes. Places of natural advantage should always be sought for the work. Almost every village in this country can afford one such spot. The shady mango topes in our rural areas would be exceedingly suited to characteristic open-air classes. Where natural shade is wanting trees may be grown.

"Buildings cannot however be dispensed with altogether. They would be necessary for wet weather. But they should be of the simplest description. The wall should be only four feet high but the rooms should be separated by partition walls raised high up to the roof. The roof should be so sloped as to cover a spacious verandah outside the class. The roof may be of any material, straw or tile, that may be cheap and available in the locality. A building of this description does not materially differ from the Hon'ble Mr. Jenning's plan of open-air primary schools which also answers to the character and description of buildings indicated by Mr. McCombe. Some of the classes of the Satyabadi School are held in buildings of this type and they are found to work comfortably.

"In a conference of the deputy inspectors of schools of the Orissa Division, I was given the pleasure and privilege to propose planting of trees in school compounds. It was accepted and at the instance of the then Inspector of Schools Orissa Division Mr. W. V. Duke, president of the conference, the department has given effect to the proposal, for which I am sincerely thankful.

"Thus the steps hitherto taken by the department meet my resolution half-way. Its acceptance by Government would only encourage the department to follow up these steps further and would, give educational officers the authority and the public, the sanction, to work out the open-air idea with great completeness and courage.

"Not only in schools but also in hostels open-air line should be followed. Hostels attached to Government high schools are costly buildings. Consequently the Boarders have to pay a high rate of seat rents. The wisdom of the system is very doubtful. Most of our student come from villages where they live in thatched houses and huts. When they come to the school hostel they find themselves under changed conditions. The change may and does, no doubt, bring them greater comfort which to most of them is a luxury. In a few years the boarder becomes so accustomed to living in such costly surroundings that he probably begins to look down upon his own village and its people. Moreover, except a very few of the students others in their after life are unable to afford to live in such costly quarters and discontent throughout their lives is an inevitable result. It is certainly not a 'divine discontent. I admit, education should raise the standard of living. But plain living and high thinking should be a better and more desirable standard to be placed before our students.

"I believe I have sufficiently explained the importance of an open-air school from economic considerations. If the Government think that costly

buildings will in the long run secure greater economy, they may raise such buildings. But the less the cost, the better, and the savings thus made can be utilized in other directions, say on a library and on tution, to effect real improvement in the efficiency of the school. I plead specially on behalf of private schools. I do no doubt that their management under completely open-air conditions will remove in a considerable degree the financial difficulties which they have to face in the beginning of their life and which in many cases renders their development almost impossible.

"The importance of the sanitary consideration already indicated should not be overlooked. On this point I have to refer again to the Satyabadi School and I may be pardoned for such frequent references which in the circumstances of the case become unavoidable. Most of our boys are poor. They have to live on simple poor diet, but they are not poor in physique for all that. I respectfully invite your Honour to bear testimoney to their physical strength and agility. They were free from influenza which was prevalent on all sides at their very door. If there be one thing more than another to which the healthy cheerful life of the Satyabadi students is due, I would unhesitatingly point to the fresh open-air in which they live, move and have their being. Allow me, Sir, to say that we have so long been courting insanitation, illhealth dyspepsia, loss of eye-sight and all such complaints at a very heavy price. Let us now pull down the walls of our schools so that out children may live a healthy and simple life in a free atmosphere, as the children of nature. Let not the place of instruction give a sense of confinement to the child. Let it be at once his school, his play ground, and the place for his recreation.

"As a place of instruction an open-air school is best suited for teaching almost all subjects that do not require experiment in a laboratory. Nature study which forms so important a part in a child's education can be done successfully only outside the school room. An open-air school affords greater scope to the teacher to carry on the direct method of teaching. Lessons on poetry, drawing, botany and hygiene can be imparted in gardens and groves in the open-air with better effect. Let the student see living nature himself with his own eyes and enjoy the sweet sounds and serene beauties around him. Such a direct contact with nature would lend his lessons a life and a force which would be utterly lacking in a closed class room. It would certainly expand his mind and bring it into communion with the 'spirit' which is 'in the wood.' Is this not a higher standard of living, worthy of being sought at the sacrifice of the luxury of living in a place?

"Considered from any stand point, an open-air school proves itself to be a distinct advantage. 'It is strange,' says Mr. Mc Combe, 'that it has taken so many generations to make this discovery'. The discovery has, however been made and the truth found out. It is now for the members of this Council and for your Honour's Government either to receive or reject this truth.

EDUCATIONAL SYSTEMS OF MADRAS AND BOMBAY.

Report by Director of Public Instruction.

The following is the summary, published in tbe *United Provinces Gazette* of April 5, of the reports on visits by Mr. C. F. D. E. La Fosse, Director of Public Instruction Provinces, to educational institutions in the Bombay and Madras presidences:—

After visiting a number of educational institutions of all kinds in the Bombay and Madras presidencies I have gathered together from my notes on individual institutions some general conclusions which may be worth considering in connection with the reform of the educational system in the United Provinces which his Honour the Chancellor foreshadowed in his Convocation address.

While it may not be altogether wise to allow school students an unlimited option at a final school examination in the selection of additional subjects, there is something to be said for it, if it encourages the study of additional subjects which are likely to prove useful in after-careers. In the Madras Presidency it is possible for a scholar to specialize to some extent in such subjects as Mathematics, Physics, Chemistry, Botany, Drawing, and Commerce by studying one or more of them as additional optional subjects. Students usually select their additional subjects with a definite aim; for example, Chemistry and Botany are often taken by boys who wish to join a medical school. The central board of the school leaving certificate examination in the United Provinces might well consider whether candidates should not be encouraged more than at present to take one or more additional subjects at the school-leaving certificate examination, and whether the courses in additional subjects could not be more closely adopted to the future careers of candidates. It might thus be possible, perhaps, to encourage more candidates to stay on at school for another year or two, instead of, as so many now do, in going to a college with no higher aim than passing the Intermediate examination of

the Allahabad University. A University Intermediate examination, being intended merely as a stage in the progress towards a degree, should not be an end in itself; it has, however, come to be regarded as a definite educational qualification.

ENGLISH THROUGH PHONETICS.

In more than one school which I visited, I found good use being made of phonetics in teaching English. Interest in the subject had been stimulated by a lecturer in phonetics from Great Britain who had been employed by the local Government to introduce the subject to the notice of schools. I was struck by the way in which even quite young students understood and appreciated the phonetic method. In one school it was noticeable that the students who had been taught English with the help of phonetics pronounced more correctly and read better than boys of higher classes who had not had the benefit of this system. This is a matter into which we might look.

In Madras and Bombay there are compulsory courses in elementary science. The object of the courses is to acquaint students with the few elementary facts of science which every boy and girl should know and to awaken an interest in Nature study. The courses are, therefore much wider than they are deep; but when allowance is made for the difficulties in the way of teaching such courses, it must be admitted that superficial as the knowledge imparted must be, they widen the outlook of the ordinary student and lay a foundation upon which students, with an aptitude for Science, can later build up a sound knowledge. I gained the impression that in Madras, at any rate, the study of science by those who took one of the science subjects as an additional subject for the school-leaving certificate examination was more intelligently pursued and that better progress was made than ordinarily under our system of Science teaching. I think this may be in part due to the elementary course in Science taught in lower classes. The whole question of Science teaching in secondary schools in the United Provinces seems to me, in the light of what I saw in Bombay and Madras, to deserve fresh consideration. No student should be allowed to pass through the school course without acquiring some general knowledge of a scientific kind, and efforts should be made to carry the knowledge of Chemistry, Physics or Botany, for instance, higher than at present, in the case of some of those who take up Science for the school-leaving certificate.

Our school-leaving certificate schemes of work and examination seem to be on the right lines and less open to criticism in some aspects than those of the presidencies I visited. I had an opportunity of discussing with principals of colleges and professors of Science the general standard attained by school-leaving certificate candidates. Speaking generally in Madras they are of opinion that the work in Mathematics and science had been steadily improving in schools as a result of the school-leaving certificate in the case of the better candidates, but that it was not so high in Arts subjects, owing to the nature of the tests. The University of Madras has had to take steps to ensure that candidates are not admitted to colleges unless they come up to its requirements. This is said to be affecting the popularity of the school-leaving certificate.

UNIVERSITY FAILURES.

A problem which is exciting a good deal of interest at the present time in Madras arises out of the heavy failure of candidates at, University examinations. There are two camps of disputants; one holds that the heavy failures are due to the mistaken policy of the University in arranging its courses to suit the needs of those only of more than average ability. The other party holds that the University is right in concerning itself with the maintenance of a high standard instead of adapting its courses to the capability of the weaker student. The controversy really seems to turn upon the question of finding other avenues for employment for Indian youths who are not able to benefit to the full by University studies. The reason why so many now attempt to pass examinations which are beyond their capacity is that a certificate of having passed a University test is the ordinary passport to service. I mention this controversy, without expressing my view upon the dispute, because the Allahabad University meets with the same sort of criticism as the Madras University, namely that in pursuance of a definite policy it 'slaughters' somewhat ruthlessly a high proportion of the candidates who appear in its examinations. On this question differences of view are the result of disagreement of fundamental conceptions of the ideals of a University. It amounts to this; should a University aim, as some of the American Universities seem to aim, at giving to as many as possible the opportunties of acquiring some University culture or should a University devote itself to the advancement of knowledge and endeavour to maintain a high standard of learning? If it follows the later course, must it not confine itself to teaching only the elect? Experience inclines to show that it cannot do both; for the admission of a large number of students of mediocre ability tends inevitably to a lowering of standard.

THE HONOUR COURSE.

As the question of honour courses at the B. A. stage frequently arises in the Allahabad University, I made enquiries into this matter at two or three colleges. Students who take the pass degree have to appear later in an examination for the M. A. degree, if they wish to obtain it. Students who take the Honours examinations in the B. A. proceed to

the degree of M. A. later without further examination. The standard of the M. A. examination is slightly lower than the standard of the Honours examinations at the B. A. stage. This has led to some confusion in the value attaching to an M. A. degree. The better colleges and the better students prefer the Honour Courses at the B. A. stage to a pass degree at the B. A. stage, followed by a further course of study for the M. A. examination. One advantage of the Honour Course, from the clever student's point of view, is that it takes only three years' continuous study after the Intermediate stage, while the pass courses for the B. A. and for the M. A. degree take in all, four. More than one professor told me, however, that there was a drawback to the Honour Course, namely, that it put too great a strain upon all but the best students in their struggle to cover the course fully in three years. One or two Science professors thought that it would be better to make it a four years' course. As a matter of fact it is in actual practice often a four years' course; for quite a number are not ready for examination in three years. A professor of English thought that the course in English had become overburdened with archaic English and Anglo Saxon, merely with a view to stiffening it for the purpose of honours. After what I learnt on the spot about the working of the Honours Courses in the Madras University, I think that the Allahabad University has been wise to resist the efforts made to introduce Honours at the B. A. stage. The advantages do not seem to me to outweigh the disadvantages. It is perhaps better to complete the general education of students at the B. A. stage and reserve more specialised studies for post-graduate courses, along the lines of the M. Sc. and M. A. degrees of the Allahabad University.

Inspection of Schools.

Arrangements for the inspection of schools in Madras and Bombay are not very dissimilar from those in the United Provinces, but the Madras Government has been quicker than any other to recognise the need for increasing and improving the quality of inspection. The Secretary of States's sanction has been received to a scheme under which the number of circle inspectors will be increased be from 9 to 25. The majority of them will be members of the Indian educational service. In the matter of actual method of inspection of schools, I do not think that we have much to learn from either Bombay or Madras, but in both the work of inspectors is more closely supervised. In both, at present, the examining of inspection reports sent in by the subordinate staff and the passing of orders upon them puts rather too heavy a strain upon the controlling authorities; but when the number of circle inspectors is increased, as proposed, this should no longer be the case in Madras. I think that there is a good deal to be said for the exercise of a closer check over the work of the subordinate inspecting staff but I would not curtail the freedom of divisional inspectors by passing their reports under regular and systematic review; it might tend to weaken initiative; besides, report-writing is, in their case, less important than their personal influence brought to bear in discussion with the management and staff. The Bombay system puts somewhat less srrain upon the inspector than that of Madras. The Inspector is given a personal assistant of the rank of deputy inspector and most of the routine work of examining reports is done for him by his personal assistant who makes notes for him on cases which require orders. I am not sure whether it is altogether wise to put so much power, even indirectly, into the hands of an officer of the same standing as those whose reports he examines, and the late Mr. Sharp perhaps had this in mind, when, shortly before he died, he proposed to create assistant inspectors. After going thoroughly into this matter, I came to the conclusion that we should do well, in the United Provinces, to arrrange in some way for the regular checking and examining of the work of the subordinate inspecting staff. It is possible however to overdo it; and seemed to me that, in some instances, the examining and checking was rather mechanical, and that it had a tendency to make the reports rather wooden and to stereotype their form. These are dangers to be carefully guarded against.

Training of Teachers.

In the extent to which arrangements have been made for the training of teachers Madras is a head of the rest of India, but I did not find much in our system which seemed to need modification in the light of what I saw in either in presidency. More attention is paid both in improving the general education of elementary teachers perhaps than with us, and a higher standard of theoretical knowledge is attempted in elementary as well as in secondary training in Madras; but in neither is there so systematic a training in the practice of teaching as with us, and physical training did not strike me as so well organized. It was only in regard to details that I found points in which we might endeavour to emulate them. For instance the arrangements for training Science teachers at Saidapet could hardly be bettered; but then the pupil teachers were generally better qualified than ours to take full advantage of them. In Madras and to a less extent in Bombay, the work in Drawing and Nature Study was in advance of ours.

In this matter we have recently pursued a rather timid policy and have in consequence, dropped behind. We ought now to make a determined effort to recover lost ground. The results achieved in both presidencies show that there is no good reason for hesitating because our teachers may possibly not be equal to the work. They can be made so, and some who have an aptitude for the work will make themselves so if given the chance. The best work I saw in Botany on my tour was being done by a young teacher who started with the handicap of a defective education. He had more than made up for these deficiences by study and experiment.

In both Bombay and Madras female education is far in advance of female education in the United Provinces is largely due to the fact that it is not hampered in either presidency by the *pardah* system, except to some extent in the case of Musalman girls. There are no serious difficulties in either province in obtaining educated women teachers nor in getting women to go to training institutions. Nor do there seem to be the same objections to the employment of male teachers, in cases in which women teachers, with the necessary qualifications, are not available. There is, for this reason, very little to be learnt which would be applicable to the United Provinces. The Government schools for girls in the Bombay and Madras presidencies are very flourishing institutions. At the head of both are English ladies, and in Madras itself the Government girls school has no less than three well qualified English ladies on its staff. We could not do better than follow the example of the Madras Government. The school is so popular with the parents that it has been found necessary to raise the fees more than once with a view to keeping admissions within reasonable bounds. The fee charged at present is actually higher than that charged in many aided schools for boys. There can be no doubt that the girls appreciate their English teachers; and their English teachers are equally devoted to them. The relations between them are very happy. But a solitary, English lady at the head of high school for girls is apt to be overburdened with work, as I found to be the case in one of the schools which I visited. To obtain the results from the employment of English ladies it would be better to have more than one upon the staff of a Government high school for girls. The question of admissions has caused difficulties. Parents are naturally more particular in the case of their daughters with whom they associate than in the case of boys. This difficulty has been met in the Government girls' school at Poona by handing over to a committee of Indian gentlemen the nomination for admission. We might well adopt a similar plan in connection with the Government girls' schools which it is proposed to open for girls of the better class at Lucknow.

WIDOWS AND POOR GIRLS.

I visited Mrs. Ranade's philanthropic institution for widows and poor girls. We need very much in the United Provinces some institutions of the type of the Seva-Sadan: but we should need at its head some one with the devotion and philanthropy of Mrs. Ranade. In the United Provinces, where the *pardah* system so greatly interferes with the employment of women, there is a more pressing need for an institution which would help widows in particulur from destitution and from worse. The Seva-Sadan has given to many a widow and to many a poor woman a new interest and purpose in life. If some one could be found to start such an institution in the United Provinces it should receive from the start generous assistance from Government. It is a mistake to defer assistance until the institution has grown to large proportions. Private enterprise, un-aided by Government, is not ordinarily equal to making suitable and satisfactory provision from the commencement. It has to improvise too much with slender resources. In this respect the Vanita Vishram, the Widows' Home at Bombay, is a better model. The two philanthropic ladies who started the institution succeeded in obtaining from the start generous help, and having gained their experience elsewhere they made no grave mistakes in organization. At the Vanita Vishram there was a most useful department for training woman teachers. A good many of the widows living in the institution were receiving a full training there; others of the students who came from outside were engaged in teaching in schools in the town and attended at the Vanita Vishram for exening training classes. It shows that there is plenty of enthusiasm for their profession among the women teachers of Bombay. An institution in the United Provinces which combined the good points of the Seva-Sadan and of the Vanita Vishram would confer an inestimable boon upon widows and other women who might find it necessary to earn their own living.

I was able to find time for a visit to the Victoria Jubilee Technical School at Bombay, and I have already sent to Government un-officially a note dealing with certain aspects of the Technical Institute, and with my views on some matters connected with technical training generally. It will be enough here if I mention that I am convinced from my visit to the Victoria Jubilee Institute that an institution for Mechanical and Electrical Engineering and Textile manufacture gains enormously by being situated in a great industrial and manufacturing centre. The

ıg business-men of Bombay have always taken ɐ interest in the Institute and have held out to ;uiding hand. Being interested in the school are also interested in the products of the school, though difficulties are, of course, met with in ag the passed students of the Institute, men of y and grit have found good employment, and indeed are occupying very important and ›nsible positions. I am inclined them to the that for the success of an institution for hanical and Electrical Engineering and Textile ufacture in the United Provinces, Cawnpore ld be the best situation. I doubt whether such ıstitution could be made a real success in any a manufacturing and industrial centre.

AGRICULTURE.

Maize as an Emergency Crop.

The Department of Agriculture, Bombay, s issued the following Leaflet (No. 10 of 18.) on Maize as an Emergency Fodder :op :—

When the rains fail, and fodder is more and more ficult to get, it becomes a matter of importance to ow that crop, with the available water, which will eld a large and quick return. The crop most ited for this purpose will vary with the season, but most parts of Western India, maize will furnish a rge amount of fodder, will grow very quickly, and ın be grown at any time of the year. *It is particularly recommended for putting in the seed in nuary or the early part of February* in the reater part of Western India.

When grown as an emergency fodder crop in this ıanner, maize should be grown thickly, drilling the ɜed into the land in rows nine to twelve inches part, and using fifty to sixty lbs. of seed per acre. 'he land should be well cultivated and manured 'ith cattle manure or any other refuse before putting n the seed.

The crop requires frequent irrigation if the best esults are to be obtained, and the land between the 'ows should be hoed with a bullock hoe once during he growth of the crop.

The maize can be cut and fed to animals at any stage, but the best returns are obtained if the cobs are allowed to form, and if the crop is cut when the grain is still soft. To obtain this, the crop requires from two to two and a half months to grow.

When grown on well cultivated and manured land, and cut at the stage suggested, maize should yield from 15,000 to 20,000 lbs. of green fodder per acre, provided it is grown on good, well-drained land.

Till the middle of February, maize is recommended as the best emergency fodder crop to grow both in Gujarat and the Deccan. *After that date some form of hot weather jowar is to be preferred.*

BOARD OF AGRICULTURE, UNITED PROVINCES.

We take the following Resolution of the Government of the United Provinces from the *United Provinces Gazette*, of 8th February, 1919 :—

In a recent resolution on the annual report of the Department of Agriculture, His Honour the Lieutenant-Governor expressed the opinion that the time had arrived for the constitution of a Provincial Board of Agriculture which would meet regularly and advise on policy and administration. His Honour has decided that a Board of Agriculture should be established with effect from the 1st of April, 1919. The constitution will be as below :—The Board shall consist of fourteen members, *viz.* : (1) The Director of Agriculture, Chairman *ex-officio*, (2) One member to be elected by the Upper India Chamber of Commerce, (3) One member to be elected by the United Provinces Chamber of Commerce, (4) One member to be elected by the British Indian Association, Oudh, (5) One member to be elected by the United Provinces Zamindars' Association, (6) and (7) Two numbers to be appointed from amongst non-officials by the Local Government, (8) Chief Engineer, Irrigation Branch, (9) Registrar, Co-operative Societies, (10) Chief Conservator of Forests, (11) Principal of the Agricultural College, (12) and (13) Two officers of the Agricultural Department nominated by the Local Government, (14) Deputy Director of Land Records.

The Board will have power to appoint committees for particular objects and to co-opt for the purposes of these committees not more than two officials and two non-officials from among persons other than members of the Board.

The nominated and elected members will hold office for three years and will be eligible for re-nomination or re-election, as the case may be.

The duties of the Board will be mainly advisory. Its functions will be to advise the Government and the Director of Agriculture with regard to such

matters as may be referred to it by the Government or by the Director for an expression of its opinion, but it may also advise in relation to any other matter which, with the permission of the chairman, may be *brought before it by any member. The Governing* Body of the Cawnpore Agricultural College will continue to be the adviser of the Local Government with regard to the affairs of that college. The Local Government will every year place at the disposal of the Board a sum which the Board will be able to utilize for any suitable purposes, including non-recurring grants to private persons or farmer with the object of the general agricultural improvement of the province.

The Board will meet on such dates and at such places as the chairman may decide. A meeting should be ordinarily held once a quarter. Papers may, if the chairman considers fit, be circulated among the members of the Board.

Members of the Board shall draw travelling and halting allowances as laid down for officers of the first class.

In the event of a difference of opinion among the members present at a meeting the opinion of the majority shall be held to be the opinion of the Board, and if the voting on any question be equal the chairman shall have a casting vote.

Any member can record a minute of dissent and the same shall, if the members so requires, be recorded in the minutes of the proceedings.

The personal Assistant to the Director of Agriculture shall be *ex-officio* the secretary of the Board. The duties of the secretary shall be—(1) to prepare the agenda of the Board's meeting and to circulate the same among the members at least ten days prior to each meeting, (2) to lay before the Board all matters for discussion, (3) to conduct the correspondence of the Board and (4) to prepare, keep, and circulate among members the minutes of the proceedings of the Board.

Sir Harcourt Butler attaches great importance to the *association of non-officials and officials in* this most important matter, and will always be glad to receive proposals which will make the Board more efficient. He thinks that the above *outlined constitution will* be a good beginning for practical work.

INDUSTRIES AND COMMERCE.

Sandal-wood Trees.

The following G. O. No. R 8145-54 Ft. 176-17-9, dated 4th January of 1919 has been issued by the Government of Mysore:—

The recommendations of the Committee are as follows :—

1. Waste lands should be given out on shraya tenure.
2. Inamdars should be encouraged to plant sandal trees on their waste lands.
3. Land-holders should be encouraged to dibble sandal seeds on all vacant lands round their holdings.
4. Areas selected for plantations should be half a mile distant from villages.
5. The sale proceeds of mature trees should be divided equally between Government and the planters.
6. The choppings from the trees should be given to the owners of the lands who pay assessment.

2. The Revenue Commissioner states that the proposal to grant waste lands on shraya tenure for sandal-wood plantation may be given a trial wherever such lands are not reserved or required for other purposes, that the third proposal does not commend itself to him and that the other proposals are matters for the orders of Government.

3. The Conservator of Forests is of opinion that the rules contained in the following Government Orders provide for efficient preservative measures as regards the *existing growth* both on occupied lands as well as on lands that may hereafter be granted for occupation, besides affording sufficient incentive for the occupants to carefully protect the growth and that no further concession is called for, specially as the occupants have neither undergone *any trouble nor have been put to any expense* on this account. As regards new plantations however that may hereafter be raised the Conservator of Forests recommends that in return for the expense, care and labour involved for a number of years in their rearing, the planters may be shown the concession of sharing the net proceeds equally with Government in the maidan parts and to the extent of 25 per cent in the sandal tracts of the malnad :—

Notification No. R. 7710—L. R. 319-08-1, dated 25th March 1909.

Notification No. R. 10916-25—Ft. 163-09-16, dated 25th March 1909.

Notification No. 7709—Ft. 13-05-18, dated 25th March 1909.

Notification No. 7191-201—Ft. 191-13-2, dated 19th February 1915.

4. Government are now pleased to direct that iste lands may be given out on shraya tenure for ndal-wood cultivation wherever such lands are not served or required for other purposes. The exact rms on which the lands may be given out should decided with reference to the merits of each dividual case.

5. Raiyats raising plantations under this order ill be entitled to 50 per cent of the net value of ature trees removed from such plantations in the aidan taluks and 25 per cent in the malnad taluks. This rule will apply also to Inamdars who are not at present entitled to the sandal trees on their lands.

6. Government consider that no action is necessary on the other recommendations of the Special Committee.

PROGRESS OF INDIAN INDUSTRIES.

Mr. F. H. Brown writes in the *Times Trade Supplement* :—

For the direction and co-ordination of the general industrial policy of India, Sir Thomas Holland's Industrial Commission proposed the creation of an Industries Board of three members, the president to be a member of the Viceroy's Executive Council.

For the latter arrangement Parliamentary legislation would be required, and the recommendation has too important a bearing upon the problem of decentralization in connection with the impending reforms to be summarily decided. Yet if the policy of earnest industrial development is to be promptly tackled, it is of the utmost importance for India to retain the services of the accomplished scientist and organizer who did such signal service as head of the Indian Munitions Board, and who presided over the investigations of the Commission. Mr. Montague has been well-advised, therefore, to agree to the appointment adinferim of Sir Thomas Halland under the designation of Industrial Adviser to the Government of India.

In reference to the fears expressed in many quarters as to the centralizing effects of setting up the proposed Board, the Viceroy has told the Legislative Council at Delhi that he regards an Imperial department as necessary to supply the desired stimulus to industrial development; but he recognizes that a provincial organization must carry out the actual work of development under provincial control. A further argument in support of the proposal was supplied by Lord Chelmsford's reply to those who see grounds for fear that British commerce may be prejudiced by the political changes in contemplation. He said that under the scheme for which he and Mr. Montagu are jointly responsible matters like railways, currency, banking, shipping, factories, petroleum, explosives, and mines would remain with the Government of India, while commerce would make its voice heard as effectively as before in the provincial Legislatures. He reminded the Council of the pledges of the report to reserve to the Government power to protect any industry from prejudiced attack or unfair competition; and he intimated that all Governors on appointment would be informed by the Home Government that this pledge must be made good.

THE CASE FOR ENERGETIC ACTION.

It is natural for business men in this country to maintain the habit of regarding India first from the commercial point of view as a good customer. In this connexion the sound claim of advocates of the far-reaching proposals of the report is that industrial development will increase local wealth, and therefore the purchasing power of the country. This view is supported by past experience, and is peculiarly pertinent at a time when in large parts of the country there is unemployment and distitution, met by a system of famine relief, because the agricultural work on which the everwhelming mass of the population depends has been largely suspended owing to the partial failure of the monsoon rains.

The development of local manufacturing industries will open up further avenues of employment, and will certainly be accompanied and followed by an increase in the total external trade. Of course, there will be displacement and readjustments and it cannot be expected that any given commercial firm will view with complacency, changes in the nature of our export trade that result in disturbance of its own particular and accustomed line. It may be further urged that under Indian conditions industrial progress will be relatively slow and fluctuating unless the Government make a very definite move forward.

Close study of the problem has convinced the authorities in India that a change is necessary, not only for the general benefit of the country, but because it is dangerous to run the risk again of India being isolated, even temporarily during a war. The experience of the last five years has brought home the hitherto neglectad consideration that under modern conditions nine-tenths of the materials required by an army in the field are similar to those of ordinary civil wants. There

are thosands of things, it will be necessary, to make in India if she is to fulfil her role as the ordinance base for British activity in the East. Most of these will never be made without Government encouragement and stimulus. The best firms can make money easily enough by simple trade, and do not wish to tie up their capital in plant and buildings. The staff of most English firms in India is sufficiently equipped for ordinary trade problems, but is lacking in scientific and technical experts. Consequently, for these firms to enter the industrial world is a step in the dark, since every modern industry is based on some branch of science of technology.

It is important to remember that the requirements of an army to-day will not cover the needs of military operations ten years hence. Consequently, the provision of facilities to manufacture the list of articles required by the army of to-day will not be sufficient. India must maintain a technical staff, including a sufficient variety of high class exports to enable the country to move with the times, and to modify its industrial activities as they develop in other countries.

How valuable an industry can be in assisting to maintain vital interests has been shown by the output of the Tata Steel Works since the summer of 1914. It is not too much to say that, if those works had not been brought into operation shortly before the war, we should have been faced with serious disasters in the East. The Tata works supplied practically all the structural steel required for military lines and other purposes in Mesopotamia, Palestine, and East Africa, as well as the rails used for urgent renewals in India. A dozen more such industries in existence before the war would have made an enormous difference to the operations east of the Mediterranean and would have saved thousands of lives.

FOREIGN COMPETITION.

It is well-known that Japan is pouring material into Inda, and Japanese firms are buying up land and house. Our absorbing pre-occupations with war requirements gave them opportunities in respect to the Indian market, of which they have taken full advantage. This fact adds to the necessity and urgency of moving with a view to making India more self-contained from the industrial standpoint. It is futile to talk of protection and the benefits of a tariff, as Indian politicians do, so long as the country has little or nothing worth protecting. The tariff powers sought by uninformed Indian orators would merely protect extremely cheap and nasty articles; no real development would occur, and when the time of stress came again, India would be unable to rely on her own resources.

Another consideration is the necessity for accompanying the impending political reforms with industrial reform. The extremists who clamour for immediate provincial autonomy are unconscious of the fact that administration is as much a technical art as carpentry, requiring an apprenticeship and practical experience. It is recognized that we must equip young Indians with suitable administrative capabilities by a much larger infusion of them into the civilian services: and one of the best ways to do this is through the industrial door. The reform structure will be unsafe, unless special means be adopted to strengthen the foundations, and one of the most important of these means is an active industrial policy. There are highly competent observers who hold that unless such a policy is pursued vigorously on a scalt at least approximating to that indicated in the report, there will be serious retrogression within the next five or ten years.

PUBLIC HEALTH AND SANITATION.

Report on the Epidemic of Influenza.

The following G. O. (No. G. 19409-21—Med. 56-18-96, dated 4th March 1919) has been issued by the Government of Mysore:—

The epidemic made its appearance in a mild form at Bangalore in July 1918 but died out soon after without causing any serious loss of life. It re-appeared in a virulent form in the middle of September and spread with alarming rapidity throughout the State. No district was free and very few villages escaped. The disease began to decline from the middle of November and subsided by the end of that month.

2. The Sanitary Commissioner states that it is not possible to connect the occurrence of the epidemic to meteorological or any other known specific cause. The severity of the disease and the symptoms thereof varied with individual constitution, age and to some extent, according to locality and it was not possible to follow any uniform treatment. Some times the respiratory organs were affected and in many cases pneumonia developed owing to mixed infection. Investigations were carried out in the Public Health Institute to find out if the pneumonia supervening on the attacks of influenza might be some form of pneumonic plague and the results proved that there was no foundation for such a theory.

3. The distress became acute as whole families were laid up and there was no one to attend to the wants of the patients. A census taken in the Bangalore City on the 6th and 7th of October revealed the

fact that as many as 10,000 patients were suffering from the disease on those days. The distress was further aggravated by the abnormal rise in the prices of food grains and shortage of supply in the market.

4. The total number of attacks according to the returns furnished by the Deputy Commissioners was 8,83,491 and the total number of deaths was 4,66,391 or 20·1 per mile of the population. The Tumkur District suffered most with a total mortality of 35,260 and Kadur the least with a mortality of 5,867. Out of a total of 40,000 attacks in the Bangalore City, 2,074 proved fatal; the highest mortality in any one day was 142 and it was reached on the 25th October. In the Mysore City there were 36,550 attacks and 1,296 deaths. The attacks and deaths in the Lunatic Asylum 12 and 2 respectively; in the Central Jail, Bangalore, 292 and 20 and in the Mysore Jail 147 and 3. These figures go to show that with proper sanitary surroundings the mortality could be reduced to the minimum.

5. A special ward was first opened in the Epidemic Diseases Hospital, Bangalore, and to prevent overcrowding and minimise incovenience to the patients, dispensaries were ordered to be kept open from 7 A.M. to 12 noon and again from 4 P.M. to 8 P.M. But as the disease spread, accommodation was found insufficient and so a temporary Hospital under canvas was opened in a convenient part of the City. Altogether 1,062 out-patients and 198 in patients were treated in this Hospital: out of these, 54 died or 28 per cent of the total number admitted. One hundred and one patients were treated in the Epidemic Hospital, Mysore. Out of these, 30 died giving a death rate of 29·7 per cent of admissions.

6. Batches of medical students were deputed to work in conjunction with the medical subordinates in the Cities of Bangalore and Mysore. In other Municipal towns, the treatment and care of the sick was left to the Sub-Assistant Surgeons in charge of the Dispensaries. Patients suffering from Influenza were admitted freely in the Mission Hospitals of Kolar and Chikballapur.

7. The medical staff was suitably augmented but as the disease spread, the demand became so great that it was not possible for the regular staff to cope with it. Qualified medical men were not available as they were in demand in all parts of India which were likewise affected and the services of local Pandits and Hakims had therefore to be utilised for the purpose. Government are glad to observe that the Pandits and Hakims did yeoman service and treated successfully a large number of patients in the cities and villages.

8. As the situation demanded rapid iteneration on the part of the medical officers, permission was accorded to the District Medical Officers to engage motor cars to enable them to travel as rapidly as they could to give medical aid and relief to the people in the outlying parts of their districts. The Sub-Assistant Surgeons itinerated within their areas and supplied medicines to patients in the villages.

9. Special accommodation was provided for housing the sick by erecting sheds near the dispensaries, in the districts of Kolar, Tumkur, Kadur and Shimoga.

10. A sufficient quantity of medicines was supplied by the Senior Surgeon to all the permanent, temporary and itinerant dispensaries. Thymol, which was used, both as a curative and as a preventive, was issued from the Public Health Institute, to all the districts and cities. Leaflets explaining the nature of the disease and detailing the precautionary measures to be adopted were issned by the Sanitary Commissioner. Sufficient provision was also made for water-supply and fuel at the cremation grounds.

11. Relief parties were organised for the distribution of medicines, milk and conji to the poor and suffering. In several places, private gentlemen fully realised the needs of the situation and readily came forward to afford their help for the relief of the sick and the poor. The progress of relief measures was greatly furthered by the institution in each local area of Special Committees consisting of the most influential of the leading citizens and the chief local officers. A very gratifying feature of the relief measures was the spontaneous response of the student population to the call of the Municipality and their ready and willing co-operation with the official organisation for the relief of distress.

12. Out of the total allotment of Rs. 1,13,866 sanctioned by Government from time to time for adopting measures to combat the Influenza epidemic in the State, an expenditure of Rs. 81,38[illegible] incurred, of which a sum of Rs. 32,186 was for th[illegible] supply of medicines.

13. Two statements are appended to this ord[illegible] one showing the number of attacks and deaths an[illegible] the other expenditure incurred in the several parts [illegible] the State.

14. Government are pleased to place on reco[illegible] their appreciation of the good work done by t[illegible] Presidents of the Bangalore and Mysore Ci[illegible] Municipalities, the Deputy Commissioners of Di[illegible]ricts and the Officers of the Revenue, Medical a[illegible] Sanitary Departments and the several Munici[illegible] Committees and public spirited citizens who spa[illegible] no pains to alleviate the suffering of the po[illegible] people. Special credit is due to the many volu[illegible]tary associations like the Amateur Dramatic As[illegible]ciation, the Boy Scouts, etc., who rendered valua[illegible] help in taking medicine and nourishment to [illegible] doors of the sick and the needy.

CO-OPERATION.

Vellore Co-operative Conference.

Speaking at the Before Co-operative Conference the Honble Mr. M. Ramachandra Rao, High Court Vakil made some interesting remarks. The following extracts are taken from his address :—

I am thankful to you for the honor you have done me in asking me to preside over this, your first conference of co-operators in your district. The people of the district have now a unique opportunity to push the movement in all directions in the district under the wise guidance of Dewan Bahadur Swamikannu Pillay, and I trust you will not be slow to fully utilise your opportunities. It must be recognised that the co-operative movement has not hitherto made the same headways in the Talugu districts as in the Tamil districts. The want of official enthusiasm for the spread at the movement was hitherto one of the contributary causes; but with the appointment of Rao Saheb R. Nageswaram, Messrs. V. Lakshminarasimha Rao and T. Srinivasa Rao we have three officers whose devotion for the cause of co-operation, and whose influence with the people have resulted in giving the necessary stimulus to the movement. Large bodies of influential non-officials in the districts such as the members of local board and municipalities, and the members of Union Panchayats are still untouched. Our main duty for some time to come is the propagation of the gospel of co-operation.

AGRICULTURAL INDEBTEDNESS.

In a district like yours with 402 villages you have only 78 societies with a memhership of 2,426. Almost all of these are agricultural credit societies. Your turn-over for the whole year, in all these societies is estimated at Rs. 75,000. I venture to think that it is hardly satisfactory in a district, which offers such a suitable field for co-operative work. The existing societies, with their limited turn-over cannot even touch the fringe of agricultural indebtedness of the district.

The extent to which the co-operative movement can be said to have succeeded in solving the question of agricultural indebtedness, can only be ascertained by an enquiry into the economic condition of the inhabitants of a whole district. The average income, the total amount of debt and the causes which have led the agriculturist into a sate of indebtedness, will have to be ascertained by a thorough enquiry. In Bengal, an enquiry into the economic life of one of the districts, Faridpur, was made very recently by a member of the India Civil Service. It was found that of the population classified as agricultural, 55 per cent were free from debt and *of the rest 24 per cent were in debt to the extent of* one quarter of their annual income and 13 per cent were in debt to the extent one half of their annual income and 7 per cent in debt about one year's income and that the average amount of debt per head for the whole population was Rs. 11 *against an average income of Rs. 52 per head.* Is the co-operative movement is to solve the question of the agricultural indebtedness to any appreciable extent, we must have a much more thorough going co-operative credit organisation than we have at present. Agriculture indebtedness cannot be remedied without a due appreciation of all the contributory causes, and the moral value of co-operation lies as much in affording the necessary stimulus to thrift as in providing facilities far cheap credit. But even apart from the ascertaining the economic condition of a tract or district, it will be interesting to ascertain how far co-operative societies have relieved rural indebtedness of their own members. In Mysore, and enquiry was recently made in this direction in regard to societies which were in existence not less than four years. It was found that the total indebtedness of the members, when the socities were started was Rs. 5,54,706 and after 4 years of co-operate activity it was ascertained that this amount was Rs. 5,55,296. These figures showed that the indebtedness remained practically stationary, and it was also found that the members of the co-operative societies were indebted to a greater extent to the sow-cars than to the societies. It may be that members of the societies in this district, are in a similar position. Even apart from an economic enquiry by the Government, it is desirable that the societies should review every year, or at least as stated intervals the economic condition of their own members. It is my belief that the credit afforded by many of the existing co-operative societies is merely temporary and will have no effect on the permanent reduction of agricultural indebtedess unless a different type of society is evolved. The sow-car has a distinct advantage over the societies in arranging long term loans. These and other questions relating to the internal working of the societies in your district require examination and I am looking forward to your deliberations with interest.

THE CENTRAL BANK.

You have a Central Bank in the district and I trust that in due time it will be able to attract enough of capital and deposits to satisfy your requirements.

I am glad to know that your Central Bank is being influentially supported and I have no doubt that the directors will take full advantage of the present favourable circumstances and expand its work in all directions.

CO-OPERATIVE HOUSING SOCIETIES.

Co-operative activities may expand in regard to the housing of the poorer classes. I am looking at the question mainly from the standpoint of regeneration of the condition of the labouring classes. Measure of sanitation, public health and hygiene have no meaning, unless the subject of housing the agricultural lobourers and the artizan classes is tackled, in the right spirit. In the United Kingdom Mr. Lloyd George, in one of his recent speeches announced that his main plank of reform and reconstruction was a scheme for housing the poorer classes. We, in this country are also making some progress in this direction. The Government of India have recently expressed the view that they would be willing to lend public funds to co-operative housing societies at comparatively cheap rates of interest. The question of the grant of assistance to co-operative housing societies in the Bombay Presidency for the encouragement of house building on approved sanitary lines has engaged the attention of the Bombay Government for some time. And they have now come to the conclusion that assistance should be given by the grant of State loans to co-operative societies which have for their object the provision of co-partnership tenancy of dwelling houses at moderate rents and in suitable localities for the accommodation of work-men, clerks and other classes of people, on which the present conditions in respect of house accommodation press heavily. The Madras Government have recently accepted a resolution in the Council which made a similar recommendation for State loans to co-operative housing societies and a beginning has been made in the Tanjore district, to solve the question of housing or a co-operative basis. We believe, there is plenty of scope for very useful work in the direction for us.

CATTLE-BREEDING.

Another form of co-operation is in relation to cattle and cattle breeding. Your breed of cattle is famous throughout India. Your district is near the Presidency town and you have also an additional advantage over other districts in that the Government cattle-breeding farm has been located in this district. I believe it may be worth your while to develop co-operative industries for the supply of milk products on a large scale and with your facilities for transport to Madras, this should prove remunerative. With expert advice and assistence, your efforts to develop these agricultural industries ought to prove successful.

AGRICULTURAL AND LAND IMPROVEMENT LOANS.

I would also invite your attention to the subject of Agricultural and Land Improvement loans. It has been a matter of just complaint for years that no attempt has been made by the ryot to take full advantage of the credit facilities offered by the Government under the Agricultural Loans Act and the Land Improvement Loans Act. These Acts have been in force for over 30 years and it has been admitted that the efforts of Government in the distributions of these loans has been a failure. The elaborate and cumbrous procedure for obtaining loans has been somewhat simplified. Notwithstanding this, the total amount advanced from the Provincial funds for these purposes has practically remained stationary. This subject has been examined by the Imperial Committee on co-operation. The extent to which Co-operative Societies may be utilized in the working of these Acts was considered from many aspects. There are arguments either way. It would be a great step forward if a scheme could be devised under which Co-operative Societies can be safely constituted as agencies for the distribution of these loans to their members. The subject has been more than once discussed at the Provincial Co-operative Conference in this Presidency and last year a resolution was adopted requesting the Registrar to formulate a scheme to carry out the objects of the Land Improvement and Agriculture Loans through primary societies approved by the societies. I do not know with whether the Registrar has framed a scheme and I would suggest to you to examine the question in the light of your practical experience in the working of these Acts.

STATISTICS.

The Outlook for Silver.

In an analysis of the Silver position, the *Metal World* states that the principal causes for the stringency that has been a marked feature for a lengthy period are :—

(1) The India Government or their advisers som time back interfered with the regular trade in th metal, and prohibited imports on private accoun This action was largely responsible for a high pre mium being placed on the value of silver, as opened the eyes of the natives of India to the im portance of hoarding the metal still further, an they refused to part with it even at advanced rate The result of this prohibition had quite a contra

effect to what was intended, as it raised the price of the metal all over the world instead of lowering it.

(2) China, who during the past two or three years has not possessed a superabundance of silver, now requires the metal more than any other country in the world. In fact, it is reported that very high prices have been offered to America by Chinese operators, and it is said that a shipment of Mexican coin was recently made from San Francisco to China, and that further shipments of silver are anticipated. After the sudden rise from 27d. to 37d. in 1916, China unloaded about £10,000,000 to India, on the hope of being able to replace it at lower prices later on. She found this impossible, and is thus compelled to replenish her stocks at much enhanced prices direct from San Francisco. It is more than probable that she will have to pay still higher prices for future requirements if she can get them.

(3) The high prices of commodities now general all over the world obviously require that more currency must be employed in trade, and had it not been for the high credit of England, France and America, and their mutual help to each other, silver at 60d., or even 70d., would to-day be cheap. Besides the demand for India and China, the Eastern markets, such as Africa, Mesopotamia, Persia, Palestine, etc., would have been expanded owing to the war, all will probably as soon as peace is made require even more silver currency in the shape of rupees and other coins.

(4) The surplus left over to the sellers of practically all commodities now sold at enormously inflated prices compared with those ruling before the war has to be invested or hoarded in the article which is the least susceptible to heavy fluctuations. Gold and silver are generally used for this purpose. *Commodities may come down in value in the near* future, but even this is very doubtful; but whatever happens labour is bound to command bigh wages; and if this be so more currency will certainly be required.

(5) For many years the parity of silver to gold was in the neighbourhood of 14 to 15½ to one of gold, or, say, about 60d. per oz., and it was only after Germany demonetised silver in 1872—which action was followed by other countries—that the value of silver began to fall away. It is likely that the metal will rehabilitate itself to something approaching its former value unless the output can be greatly increased, which is unlikely although the outlook in Mexico is much better.

(6) As regards production, this is now under 200,000,000 oz. per annum, against 226,000,000 oz. a few years back, and, considering the enormous expansion of trade all the world over, coupled with the very large increase in the production of gold since 1850, silver has not increased in anything like the same proportion. Furthermore, there is no sign of new silver mines being found, and it is therefore quite likely that there will be a shortage of silver for many years to come. At the present time there is undoubtedly a shortage in all countries of the world, whether it be China, India, Russia, France, Italy Holland, and Belgium, to say nothing of the enemy, countries. These shortages will have to be made good before there will be a surplus large enough to affect the market.

IMPORTS OF COPRA AND COCONUT OIL INTO U. S. A.

The imports of copra and coconut oil into the United States for year ending 30th June, 1918, by countries of origin are given in the following table :—

From	Copra, not shredded		Coconut oil	
	Pounds	Value dols.	Pounds	Value dols.
Spain	12,300	580	...	...
British Honduras	249,478	18,275	...	...
Canada	388,842	26,119	582,159	65,000
Honduras	377,375	31,319	...	...
Nicaragua	23,400	1,876	...	...
Panama	101.385	13,344	...	...
Salvador	4,788	710	...	...
Mexico	42,938	2,571	...	...
Newfoundland and Labrodor	6,770	474	...	...
Jamaica	1,563,327	121,279	...	...
Trinidad and Tobago	3,984,438	349,638	...	...
Other British West Indies	156,738	13,279	10,049	1,648
Cuba	7,588	228	...	...
Dominican Repbulic	514,642	31,975	...	...
Haiti	21,177	1,867	...	...
Colombia	7,562	486	...	...
British Guiana	73,783	6,525	232,690	38,165
Venezueia	6,322	213	80,555	14,106
British India	224,000	20,000	...	...
Strait Settlemenls	17,039,945	1,024,927	150,000	16,600
Other British East Indies	3,278,380	241,442	...	...
Dutch East Indies	45,327,117	2,445,362	39,422,251	5,016,509
Japan	7,395,480	384,925	50,256,558	6,930,654
Australia and Tasmania	96,397,324	9,104,493	2,951,647	378,825
New Zealand	3,082,402	240,586	229,065	35,308
Other British Oceania	43,124,366	2,979,641	...	...
French Oceania	20,385,019	2,576,473	389,546	63,201
German Ocoani	14,554,055	856,177	...	...
Philippine Islands	219,555,171	9,949,785	154,704,481	18,229,36
Brazu	...	...	5,460	78
China	...	...	1,176,072	130,96
Hongkong	...	...	4,320	64
Total	486,996,112	26,945,569	259,194,853	30,919,78

MYSORE ECONOMIC CONFERENCE.

PROGRESS IN THE DISTRICTS.

Chitaldrug.

AGRICULTURE.

Sugar-cane Crushing Mills.—Steps were taken to stock crushing mills with Co-operative Societies for hiring them out to sugar-cane growers.

Cattle Shows.—At the instance of the President, District Committee, arrangements were made to hold Cattle Shows in every Taluk and prices in the shape of good breeding bulls costing about Rs. 150 each being awarded to the village which exhibits the largest number of cattle of the best breed.

EDUCATION.

Funds for a Library.—Mr. Papanna of Bilchode in the Jagalur Taluk has paid a contribution of Rs. 100 for starting a Library at Bilchode.

Metal Work Home Industries class.—The metal work Home Industries Class at Hosadurg which had ceased to work for some time was revived from February last.

Completion of School Buildings.—The construction of school buildings at Navall and Umblabyle was completed.

Shimoga.

AGRICULTURE.

Holding of a Cattle Show.—The Committee resolved to hold a Cattle Show at Shimoga on the 11th April, 1919, and appointed a Sub-Committee for the purpose.

Increasing the Production of Food-Stuffs.—The letter from the Secretary, Agricultural Committee, calling for the suggestions of the District Committee as to the grant of further concessions for increasing the production of food-stuffs in the State, was read, and the committee resolved to move the Government to buy 5,000 pallas of seed paddy for distribution among the people, and 20 pallas of selected seeds of Madinagiri *Ragi* for distribution in the Honnali and Chennagiri Taluks.

EDUCATION.

Starting of New Schools.—One Girls' School and one Panchama School were started in the Tirthahalli Taluk.

INDUSTRIES AND COMMERCE COMMITTEE.

The following is a brief report of work done by the Committee during the months of January and February 1919.

I. THE MYSORE DASARA INDUSTRIAL AND AGRICULTURAL EXHIBITION 1918.

Attention was paid to the distribution of awards and remittance of sale proceeds to the concerned parties. The report of the Exhibition was submitted to Government on 8—1—19.

II. MATCH INDUSTRY.

The proposals of the Special Forest Officer for the purchase of match-making machinery were discussed by the Committee but final recommendation is reserved pending the receipt of further information called for from the Special Forest Officer.

III. FACILITIES FOR INDUSTRIES AND TRADE IN MYSORE.

The scheme proposed by the Government to open an Industrial fund in the Bank of Mysore was considered by the Committee. As a result of discussion, the question has been referred to a Sub-Committee for sending up a workable scheme to enable this Committee to submit their final recommendations to Government.

IV. TILE FACTORIES.

(1) Mandikal Tile Factory.

The proprietor of this factory had applied for certain concessions (Viz) supply of fuel at half the seigniorage rates and free removal of clay from the Tank bed. As recommended by the Conservator of Forests, the Committee decided that no concessions could be given regarding the supply of fuel required by the factory. As regards the other concession, the sense of the Committee was that the Deputy Commissioner might look into the matter and grant the necessary concessions from year to year if he was satisfied of their real necessity.

(2) Gubbi Tile works.

Concessions prayed for by Messrs. Rudrappa and Murigappa of the Gubbi Tile works for the removal of clay, free of charge, from the bed of the Herur tank for a period of 3 years were entertained by the Committee.

V. MODERN HINDU HOTEL, KADUR.

The Committee agreed with the views of the District Committee and recommended the grant of (1) a loan of Rs. 500 for the purchase of vessels and furniture on the security of the property purchased and (2) a house rent of Rs. 25 per mensem to Mr. H. Venkata Rao for starting a Modern Hindu Hotel

(2) Non-vegetarian Hotel in Bangalore.

The Committee rejected the offer of Mr. E. Chinnaswamy Pillai and Messrs. Shamsuddin & Co., for starting a non-vegetarian Hotel in Bangalore City assisted by Government.

VI. FLOUR MILL INDUSTRY.

The loan of Rs. 14,000 applied for by Mr. P. Subramachetty and three other merchants of Bangalore for starting Flour mill industry in Bangalore City was not recommended by the Committee who were of opinion that the Industry would not thrive in Bangalore under existing conditions.

VII. EXTENSION OF APPRENTICE COURSE.

On the recommendation of the Sub-Committee, the term of apprenticeship of the following scholarship holders was extended by the Committee for one more year from the dates noted against their names.

M. A. Narayanacharya	... 2 9 18
K. Ranga Rao	... 28 10 18
M. Abdul Rahiman	... 1 7 18
S. Rajappa	... 1 7 18
M. Abdul Satar	... 1 8 18

VIII. BUDGET ESTIMATES FOR 1919—20

The Budget estimates amounting to Rs. 30,300 for 1919—20, as against Rs. 43,100 for the current year were passed by the Committee.

IX. CONTROL OF INDIAN COTTON.

The Subject *re* the Control of Indian cotton proposed by the Board of Trade, during the reconstruction period, in order to avoid the possibility of stocks being accumulated for sale to enemy countries was discussed by the Committee in detail. The Committee endorsed the opinion of the Bombay Chamber of Commerce *re* the control of Indian cotton as a temporary measure.

P. SUB-COMMITTEES.

The proceedings of the meetings of the following sub-Committees were placed before the Committee and approved.

Name of the Sub-Committee.	Date of the meeting.
(*a*) Bangalore M. H. Hotel Sub-Committee	... 19—12—18
(*b*) Sub-Committee for the development of minor Industries	... 14—12—18
(*c*) Sub-Committee for the publication of bulletins	... 11—1—18

(2) The Sub-Committee to consider the questions of (1) further development of paints (2) manufacture of linseed oil and (3) manufacture of distemper met on the 4th February 19. Their recommendations will be placed before the Committee at their next meeting for opinion.

M. N. BALA RAJ URS,
Secretary.

EDUCATION COMMITTEE.

The following is a brief Report of work done by the Education Committee during February and March 1919 :—

I. SUB-COMMITTEES AND THEIR WORK.

Six Sub-committees met during the period :—

1. *Business Education.*—(Meeting held on 23rd February 1919). The synopsis prepared by Mr. K. T. Shah for the Industries and Commerce Committee was proposed to be adapted with suitable modifications by the Education Committee. The Industries and Commerce Committee has been asked for a copy of the synopsis.

2. *Moral Education.*—(Meeting held on 25th February 1919). It was resolved that certain Professors of Philosophy be asked whether they could undertake to write, in consultation with the Inspector-General of Education, the Moral Education text-books, on the lines approved by Government.

3. *Libraries.*—(Meeting held on 26th February 1919). The Sub-Committee resolved that the Public Libraries at Bangalore and Mysore be placed under the control of the Education Department. They also approved of the distribution of the allotments for the development of the two Libraries. Action was taken on the latter resolution and a communication to Government was addressed. The other recommendations of the Sub-Committee will be placed before the Education Committee to-day.

4. *Scholarships to Backward classes students.*—(Meeting held on 26th February 1919). The question of a more satisfactory distribution of the scholarships was considered. The Sub-Committee agreed to the proposal of first allotting the scholarships to the saveral communities and then dividing the allotted scholarships among the Districts in proportion to number of pupils in each. The recommendations will be placed before the meeting of the Education Committee to-day.

5. *Women's Education.*—(Meeting held on 27th February 1919). The Sub-Committee considered the question of making Kannada the medium of instruction in girls' institutions, the majority being of opinion that it should not be made the medium. This will be placed before the Education Committee to-day.

6. *Vocational Guidance.*—(Meeting held on 15th March 1919). Five applications for advice were disposed of. And it was resolved that the draft suggestions for developing the work in the

direction might be sent to the members for opinion. Other resolutions regarding the publication of booklets will be placed before the Committee to-day.

7. *Physical Education*.—The proposal to organize a tournament in Indian Games made by the Chairman was circulated, but the meeting was adjourned. The rules are being framed.

II. INDUSTRIAL EDUCATION.

(*a*) The work turned out by the Home Industries Institute and the Home Industries Classes is detailed in the appended statements. Orders of Government have been received sanctioning the transfer of the Institutes to the Industries and Commerce Department, and classes to the Edncation Department, with effect from 1st April 1919, and steps have been taken to hand them over to the respective Departments. Instructions have issued to the Managing Committees of the two Iustitutes and to the Presidents of the District Committees to arrange for the transfer and forward to this office detailed charge reports.

(*b*) Recommendations were made to Government in regard to the provision of Industrial Schools for *gosha* ladies, and Government in reply said that the Education Department had taken steps in this direction.

(*c*) *The Higher Tailoring Class* :—The number of pupils increased from 12 to 17, and satisfactory progress has been reported. It is gaining in popularity under the present instructor.

(*d*) Proposals were submitted for opening a class for teaching Leather work.

III. SPECIAL PHYSICAL CULTURE CLASS.

There are on the rolls 146 stndents under training in the Special Physical Culture Class. Indian games are also being regularly taught, and steps are being taken to organize a tournament at Mysore during the Birthday week in Indian games, and to award prizes, etc. to winners. The classes are very popular and appreciable progress is being made.

IV. LIBRARIES.

(*a*) The work of tbe Libraries during these months is detailed in statement No. 2 appended. Orders of Government having been received sanctioning a Librarian for the Mysore Library on a pay of Rs. 60 rising to Rs. 75, applications have been called for by notification in the Gazette.

(*b*) The Managing Committee of the Bangalore Public Library was reconstituted. Proposals have been received for reconstituting the Committee of the Mysore Library and these will be placed before the Education Committee to-day.

(*c*) Travelling Libraries are being circulated in the Taluks of Chitaldrug, Mysore and Tumkur Districts.

(*d*) There are already a number of villages offering to purchase these libraries permanently for their own use. Arrangements are being made to meet their request.

V. TRAINING OF TEACHERS IN MUSIC.

(*a*) A scheme for training teachers in music drawn up by the Chairman and approved by the Inspector-General of Education was circulated to the members.

(*b*) *The Music School*.—The Chairman revised the music school scheme as desired by Government and forwarded it to the Inspector General of Education for the adoption of further steps in the matter.

VI. ADULT FEMALE EDUCATION.

Further details in regard to the working of the scheme for the Edncation of Adult Ladies were kindly furnished by Rao Bahadur Mr. M. Shama Rao and were submitted to Government.

VII. PATRONAGE OF BOOKS.

A recommendation was made to Government for paying an honorarium to the anthor of "Samajadharmada Kaipidi" and Government have enquired how it is intended to make use of the book.

VIII. ECONOMIC LECTURER.

Mr. H. K. Mallappa who was appointed Lecturer for both the cities of Bangalore and Mysore delivered lectures in various parts of Bangalore, on "Cottage and Home Industries," "To serve humanity is to serve God," "A half hour with Kannada Proverbs" "Adult Education and Industrial Education." In addition to the lectures, he visited certain small factories in the city of Bangalore and spoke to the people on Co-operation, Insurance, etc. A Library was also started by him. In the month of February he could not go to Mysore as he had a programme of lectures pre-arranged in Bangalore.

IX. POPULAR SCIENCE LECTURES.

The Kannada Popular Science Association was requested to suggest a programme of lectures which after its receipt will be placed before the Education Committee.

X. VISUAL INSTRUCTION.

The Committee's recommendation that the scheme may be given effect to in the District Head-quarters was approved by Government in part, only two District Head-quarters being selected for this purpose.

A recommendation was also made to Government to transfer the working of the scheme to the Education Department, which has also been approved.

XI. RELIGIOUS INSTRUCTION.

Mr. Shankaranarayana Rao to whom this subject has been allotted presided over a meeting of those interested in this branch of Education, the Secretary having been also present. The resolutions will be laid before the Education Committee.

XII. LADIES MAGAZINE.

Applications were invited by notification, for uudertaking the editing of the Magazine.

XIII. PUBLIC LECTURES.

Under the auspices of the Committee two interesting public lectures, one by Mr. K. Shankaranarayana Rao, M.A., B.L., under the presidency of Sir N. G. Chandavarkar Kt. on "Some Educational Needs of the Present," and the otber by Sir N. G. Chandavarkar Kt. bimself under the presidency of Principal G. P. Wishard, M.A., B.SC. on "Some Neglected Corners of Civic Conscience," were delivered on the 20th and 22nd instant respectively.

XIV. COMPILATIONS.

(a) A revised edition of the pamphlet "Mysore Students Abroad" is under preparation.

(b) The figures for the Development forms for all the 100 units were completed and submitted.

V. SUBRAHMANYA IYER, *Secretary*. J. S. CHAKRAVARTI, *Chairman*.

The Madras Government desire to place from time to time at the disposal of the public and of the Press as accurate information as possible regarding the situation in respect of the supply of foodstuffs and kerosene oil and the measures which are being taken by the Government to relieve it. It has therefore been arranged that the Director of Civil Supplies shall in future issue a monthly review which will contain a summary of the situation and of the methods and operations by which it is being met. This monthly review will supply all necessary statistical data and explanatory notes. The first of these reviews will be issued at as early a date in the month of May as possible and will deal with the period ending 30th April 1919.

BOOKS IN BRIEF.

An Imperial obligation—Industrial Villages for partially disabled Soldiers and Sailors.—*By T. H. Mawson, with an introduction by Field-Marshal Sir Douglas Haig Kt. G. C. B. G. C. V. O. K. C. I. E. and a frontispiece by Louis Raemackers. Grant Richards Ltd., London 4s. 6d. net.*

This is a charming book written in Mr. Mawson's charming style. It tackles a most important problem in a spirit which is appealing to a degree. Written during the height of the War, it sought in a thoroughly practical way to prevent anything approaching destitution among those returning mained and broken and incapable of re-entering the field of commercial and industrial competition on the olp terms. The book does not concern itself so much with the training of the disabed soldier as the creation of an environment suitable to the soldier in his new conditions. As Mr. Mawson well puts it, "if our mauled or mutilated wards are compelled to carry on their work amid the evil conditions so often existing in our towns, however, well-housed in hoem and workshop, instead of in the villages which it is our desire and aim to see placed at the disposal of employers of wounded soldiers as well as of those who work at independent crafts, we shall certainly have failed, as a nation and individually towards them." Mr. Mawson's book is a thoroughly suggestive one and is likely to be of great use to those who in this State are thinking of laying out industrial suburbs etc. It might be added that the book is throughout exquisitely illustrated. Raemaekers' picture of the disabled soldier adds to its interest, while Field-Marshal Sir Douglas Haig's foreword ought to make it go far indeed.

India's war Finance. *By V. G. Kale M.A. Professor of History and Economics, Fergusson College, Poona. Aryabhushan Press, Poona.*

Professor Kale describes in this little book how India served the Empire in the late war and how her finance and currency were constantly adjusted to suit the supreme ends in view. He also suggests the reforms now rendered imperatively necessary in the financial and economic organization of the country in the light of the experience gained during the past five years. Professor Kale writes with knowledge and precision. His clearness as an expander is seen to great advantage in some of the chapters of this book, notably those on "Retrospect and Prospect," "Taxation and Expenditure" and Currency and Expenditure. To those who have crude

notions about reconstruction as applied to India, we would commend the last chapter of this book which we have no doubt will prick many of the bubbles that are set afloat in this connection. The book deserves to be read widely as it deals with matters of great moment to this country.

The League of Nations—its Economic Aspect.—*By Hartley Withers—Oxford University Press, London and Bombay. Threepence net.*

Mr. Hartley Withers—and no body is better fitted than he—gives in this pamphlet a graphic idea of the evils that will befall the civilized world if a League of Nations is not established. A League of Nations means in one word increased production and happiness to all; no League of Nations means destruction and multiplying armaments and other engines of destruction, political rivalry and warfare for world domination. As Mr. Withers says "with a greater output of goods, there would be an opportunity which Statesmanship, freed from war's nightmare by a League of Nations, might surely be able to grasp, of improving the distribution of wealth, so that the nations might rival one another, not only in the figures of their trade and the mass of their products, but in the well diffused prosperity and high standard of comfort among all classes of their citizens."

RECENT PUBLICATIONS.

Injurious Insects and useful Birds. *Successful Control of Farm Pests. By F. L. Washburn. (Lippincott's Farm Manuals), 8½×5¾, xviii. +453 pp. Lippincot. 7s. 6d. n.*

Productive Sheep Husbandry. *By Walter C. Coffey. (Lippincott's Farm Manuals). 8½×6, x. +479 pp. Lippincott. 10s. 6d. n.*

Indian Industrial Commission, 1916-18, Report. *9×64, 355+xviii. pp. Calcutta: Superintendent of Government Printing. Re. 1, or 1s. 6d.*

The Training of Youth. *By T. W. Berry, Director of Education, Rhondda. 7½×5¼, 207 pp. Fisher unwin. 7s. n.*

The Home I Want. *By Richard Reiss, 7½×4¾, xiv.+175 pp. Hodder and Stoughton. 2s. 6d. n.*

Seed Farming in Britain. *A practical treatise on the cultivation of vegetables for the production of seeds. By A. J. Macself. 7½×4¾, 32 pp. Burnley: Hortus Printing Co. 2s. 6d.*

Firewoods. *Their production and full values. By A. D. Webster. 10½×7¾, 95 pp. Fisher unwin. 12s. 6d. n.*

War Time Control of Industry. *The experiences of England. By Howard L. Gray, 7¾×5¼, xix.+307 pp. The Macmillan Co. 10s. n.*

The Development of Japan. *By Kenneth Scott Latourette. 8×5½, xi+237 pp. The Macmillan Co. 8s. n.*

The Century of Hope. *A Sketch of Western Progress from 1815 to the Great War. By F. S. Marvin. 7¾×5¼, vii+352 pp. Oxford: Clarendon Press, London, Milford. 6s. n.*

Coal Tar Dyes and Intermediates. *By E. DE Barry Barnett, Consulting Chemist, to Bagley, Mill, and Co. (Industrial Chemistry Series.) 8¾×5¾, ×vii 213 pp. Bailliere, Tindall, and Cox. 10s. 6d. n.*

The Housing Problem. *Its modern aspects and practical solution. By James Hartley, F. R. S. L., and Albert Winstanley, Licent. R.I.B.A. 8½×5¼, 152 pp. Preston: British Pictorial Press Company. 5s.*

The current number of the *Bulletin of the Imperial Institute* (London: John Murry, 2s. 6d.) contains a comprehensive article on the Empire's trade in wool in its relation to the wool trade of the world. The total amount of wool produced is estimated at about 3,000 million pounds, of which almost two-fifths is contributed by British countries, Australia alone producing nearly one-fifth. Of the 460,000,000 lb. of imported wool used in Great Britain before the war more than three-quarters came from British sources. Nevertheless, as is pointed out, Germany was actually using more Australian and South African wool than England. During the three years before the war England was exporting woollen manufactures of the average annual value of 27 million pounds sterling. Since then the growth of the industry has been remarkable. The average annual value of the exports of woollen manufactures has increased to over 36½ million pounds and at present nearly twice as much wool is being used by the weaving industry as in pre-war times and nearly the whole of it comes from within the Empire. The article includes an account of the production of wool within the Empire and in foreign countries, and full particulars are given of the trade in woollen goods of the United Kingdom, the chief European countries, the United States and Japan. The same number contains an informative article on the manufacture and industrial utilization of paper yarns, which during the war were so largely used in Germany for fabrics of various kinds owing to the scarcity of jute and cotton. The manufacture of cordage and fabrics from paper yarn has been carried on in England but it appears unlikely that any extensive development of the industry will take place there so long as ample supplies of jute are obtainable at a reasonable price. The section devoted to an account of recent investigations conducted at the Imperial Institute includes among other things a report on the value of Indian tea seed as a source of oil.